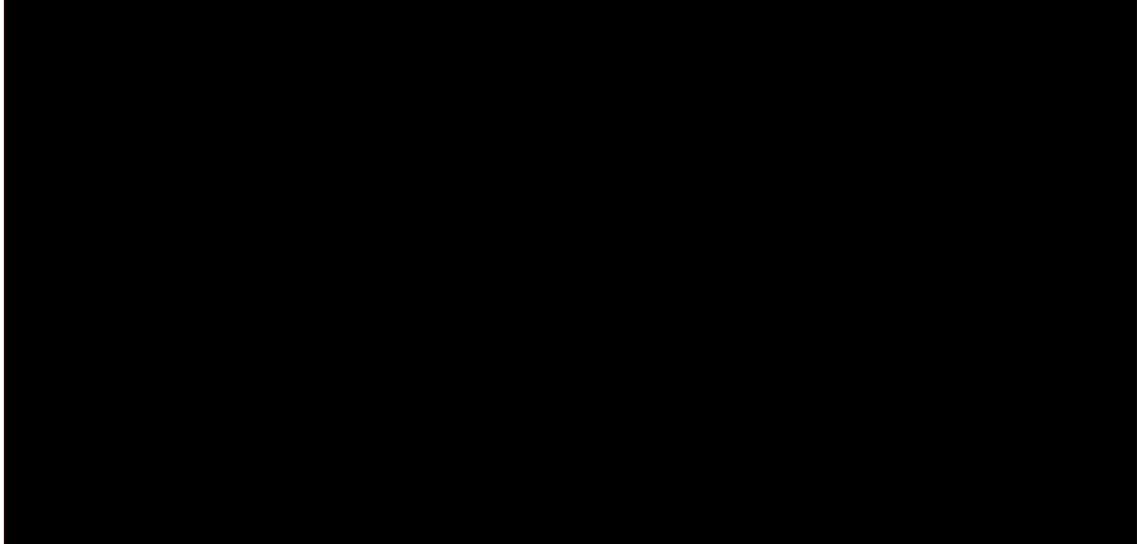


REDACTED

The Narragansett Electric Company
d/b/a National Grid
RIPUC Docket No. 4770
Attachment DIV 7-49-252
Page 1 of 92

REDACTED

Boston Gas Company and Colonial Gas Company
each d/b/a National Grid
D.P.U. 17-170
Attachment AG-21-39-41
Page 1 of 92

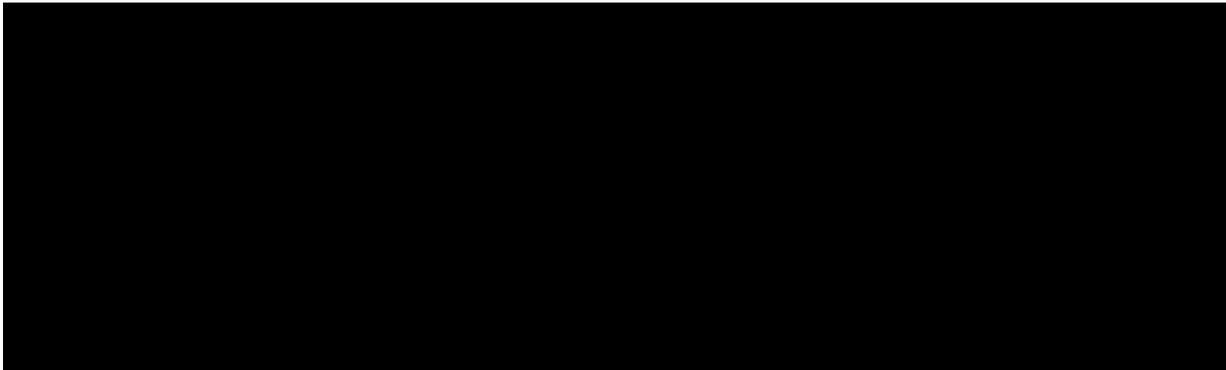
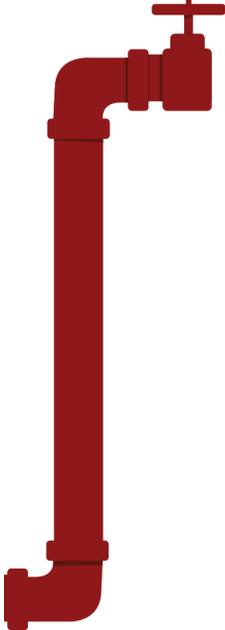


Module 9
IS Enabling



Table of contents

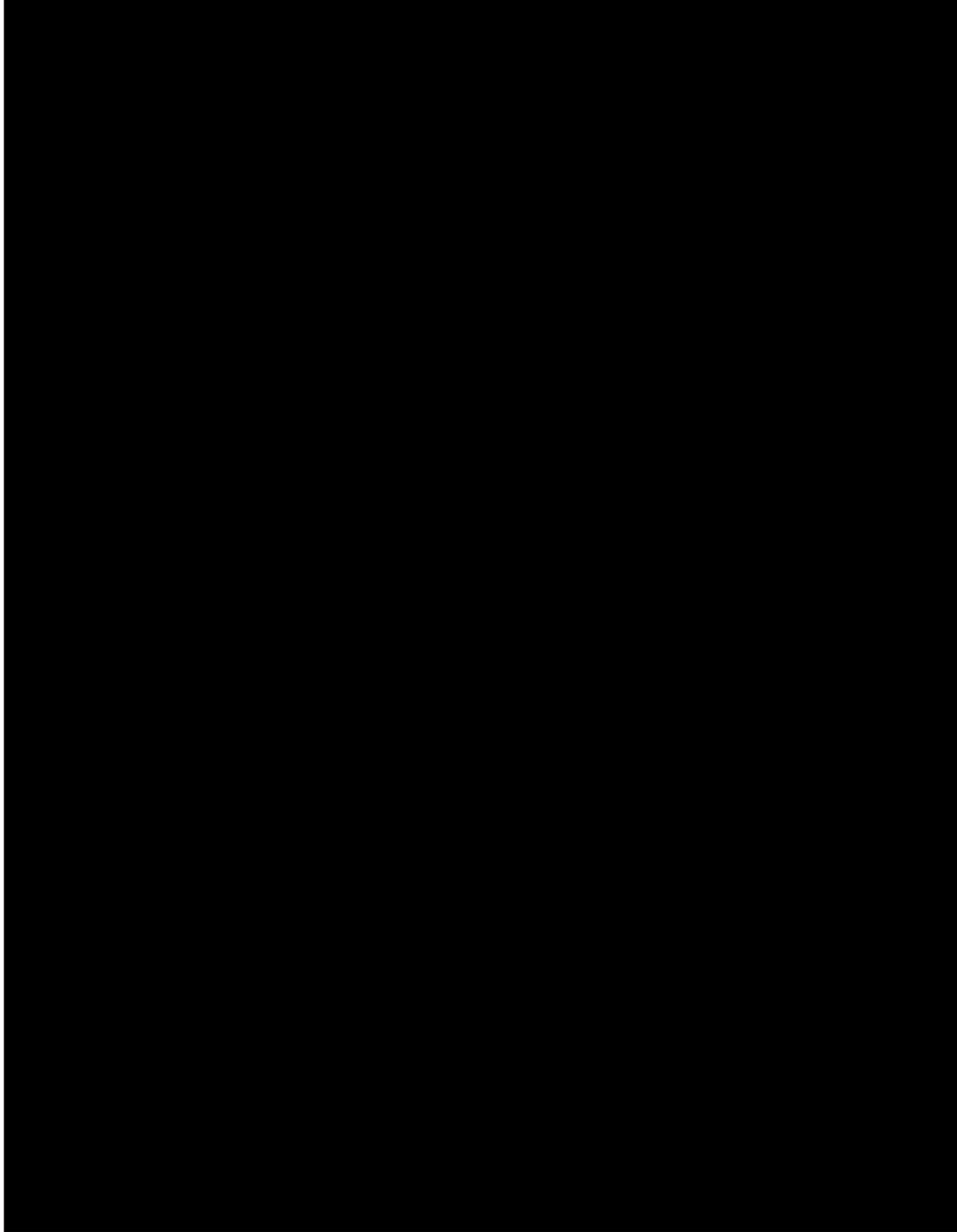
- 0. Summary of revisions2
- 1. Key and critical support personnel6
- 2. Project plan, [REDACTED]8
- 3. Resource planning and staffing [REDACTED] 15
- 4. Module initiatives [REDACTED]28
- 5. Proposed service [REDACTED]36
- 6. Key program [REDACTED] requirements38
- 7. [REDACTED] assumptions43
- 8. Estimation factors used for work [REDACTED] assumptions.. 51
- 9. [REDACTED]58
- 10. [REDACTED] 60
- 11. Clarification questions62
- 12. [REDACTED] 80
- 13. [REDACTED]83



REDACTED

The Narragansett Electric Company
d/b/a National Grid
RIPUC Docket No. 4770
Attachment DIV 7-49-252
Page 3 of 92

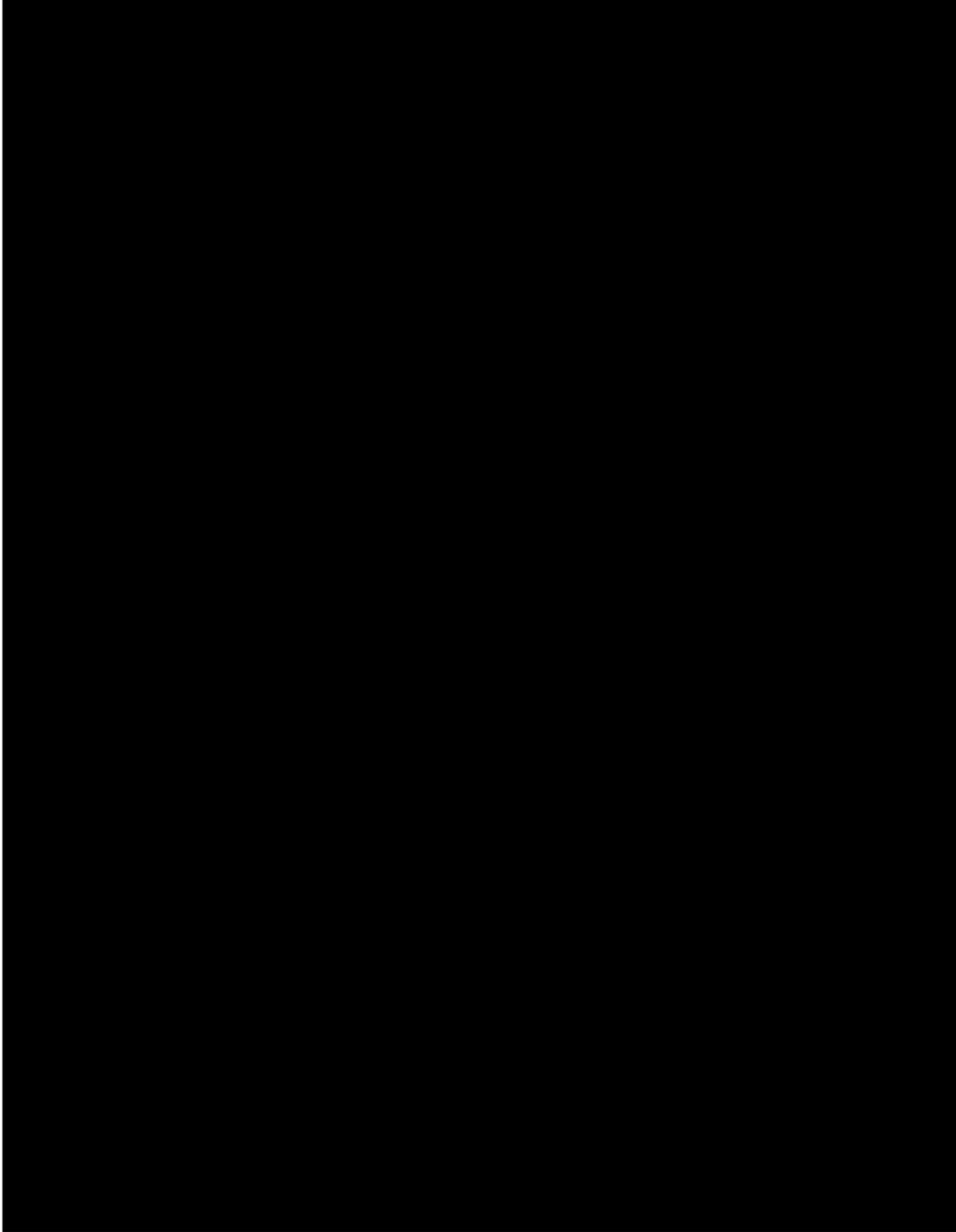
REDACTED Boston Gas Company and Colonial Gas Company
each d/b/a National Grid
D.P.U. 17-170
Attachment AG-21-39-41
Page 3 of 92



REDACTED

The Narragansett Electric Company
d/b/a National Grid
RIPUC Docket No. 4770
Attachment DIV 7-49-252
Page 4 of 92

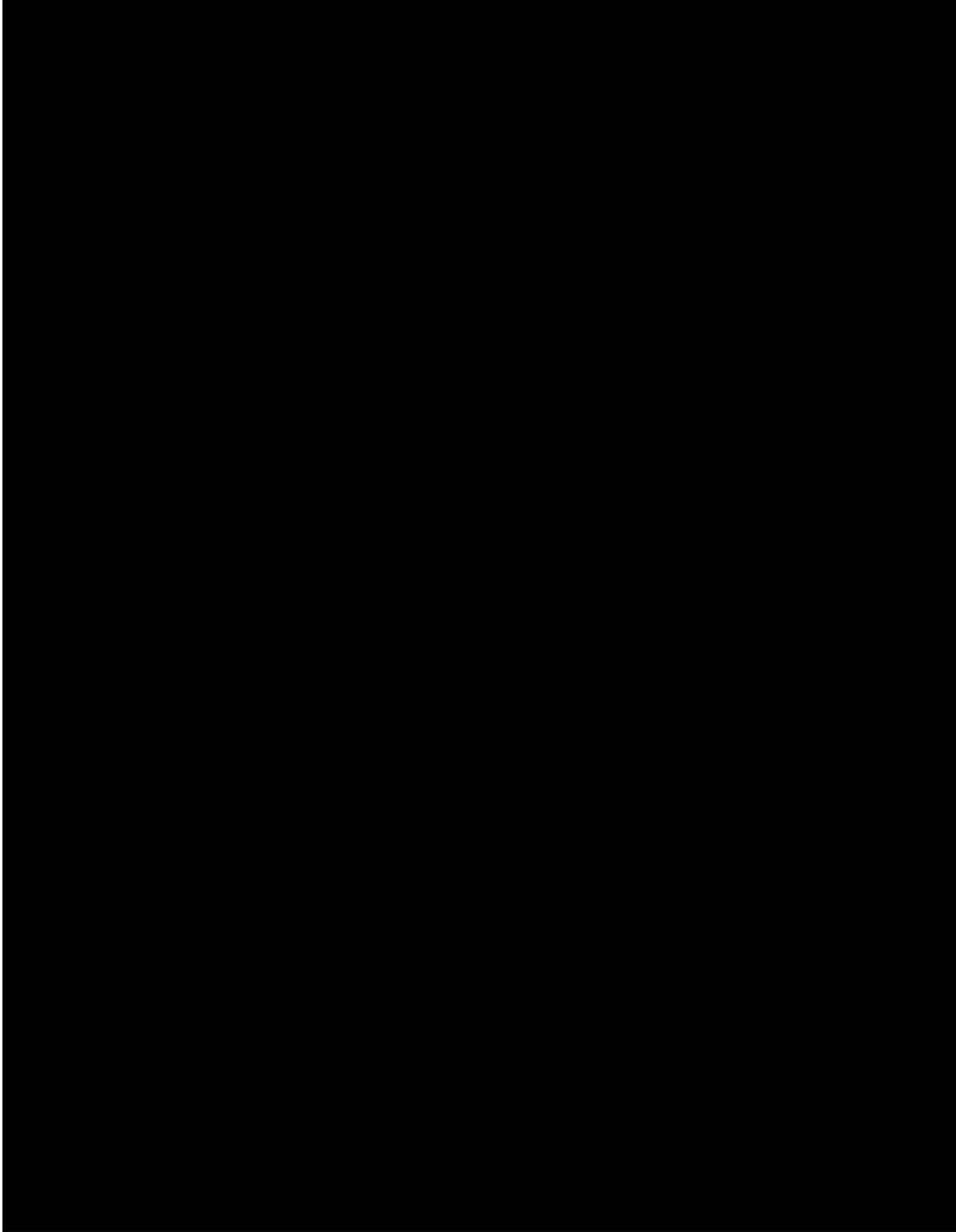
REDACTED Boston Gas Company and Colonial Gas Company
each d/b/a National Grid
D.P.U. 17-170
Attachment AG-21-39-41
Page 4 of 92



REDACTED

The Narragansett Electric Company
d/b/a National Grid
RIPUC Docket No. 4770
Attachment DIV 7-49-252
Page 5 of 92

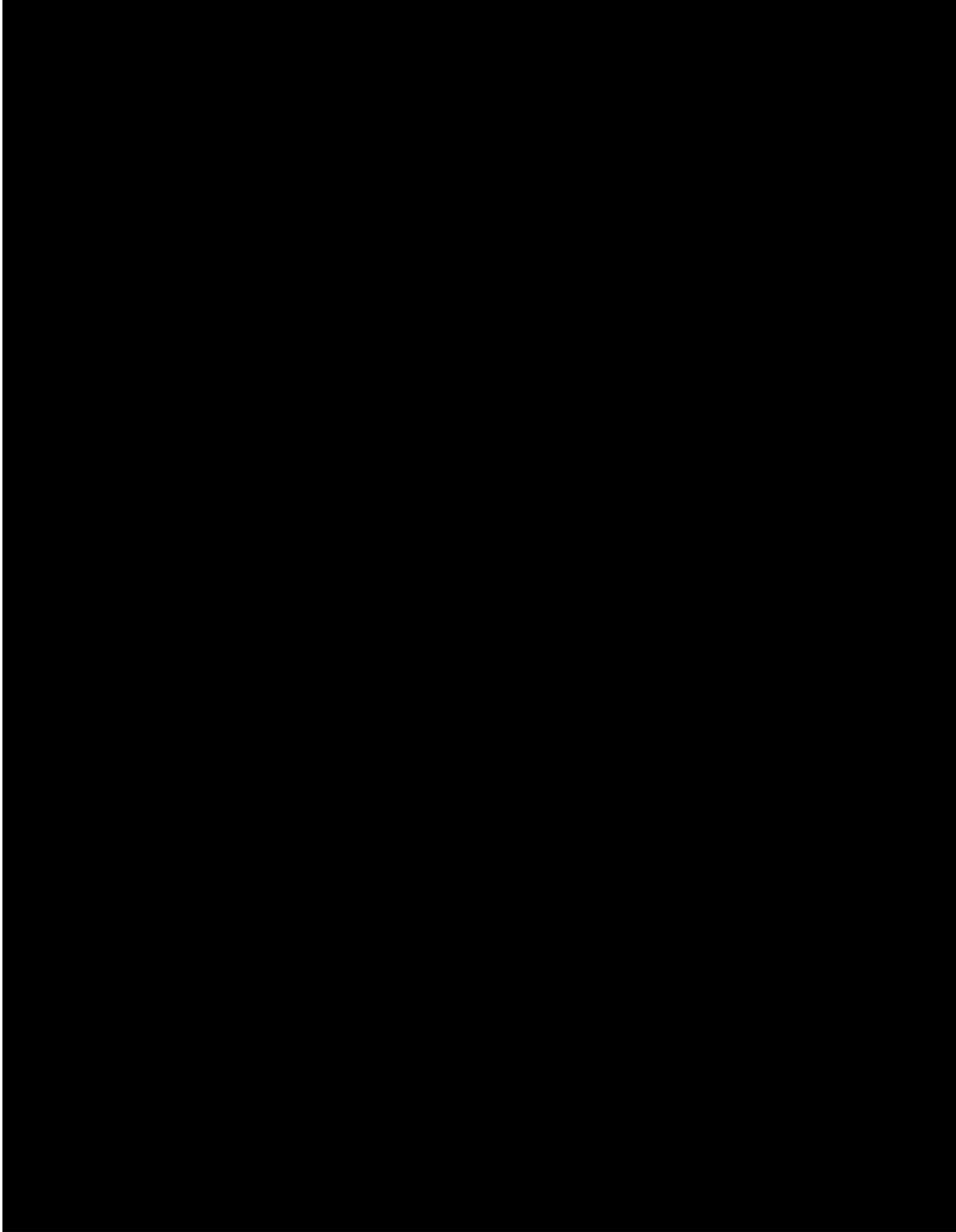
REDACTED Boston Gas Company and Colonial Gas Company
each d/b/a National Grid
D.P.U. 17-170
Attachment AG-21-39-41
Page 5 of 92



REDACTED

The Narragansett Electric Company
d/b/a National Grid
RIPUC Docket No. 4770
Attachment DIV 7-49-252
Page 6 of 92

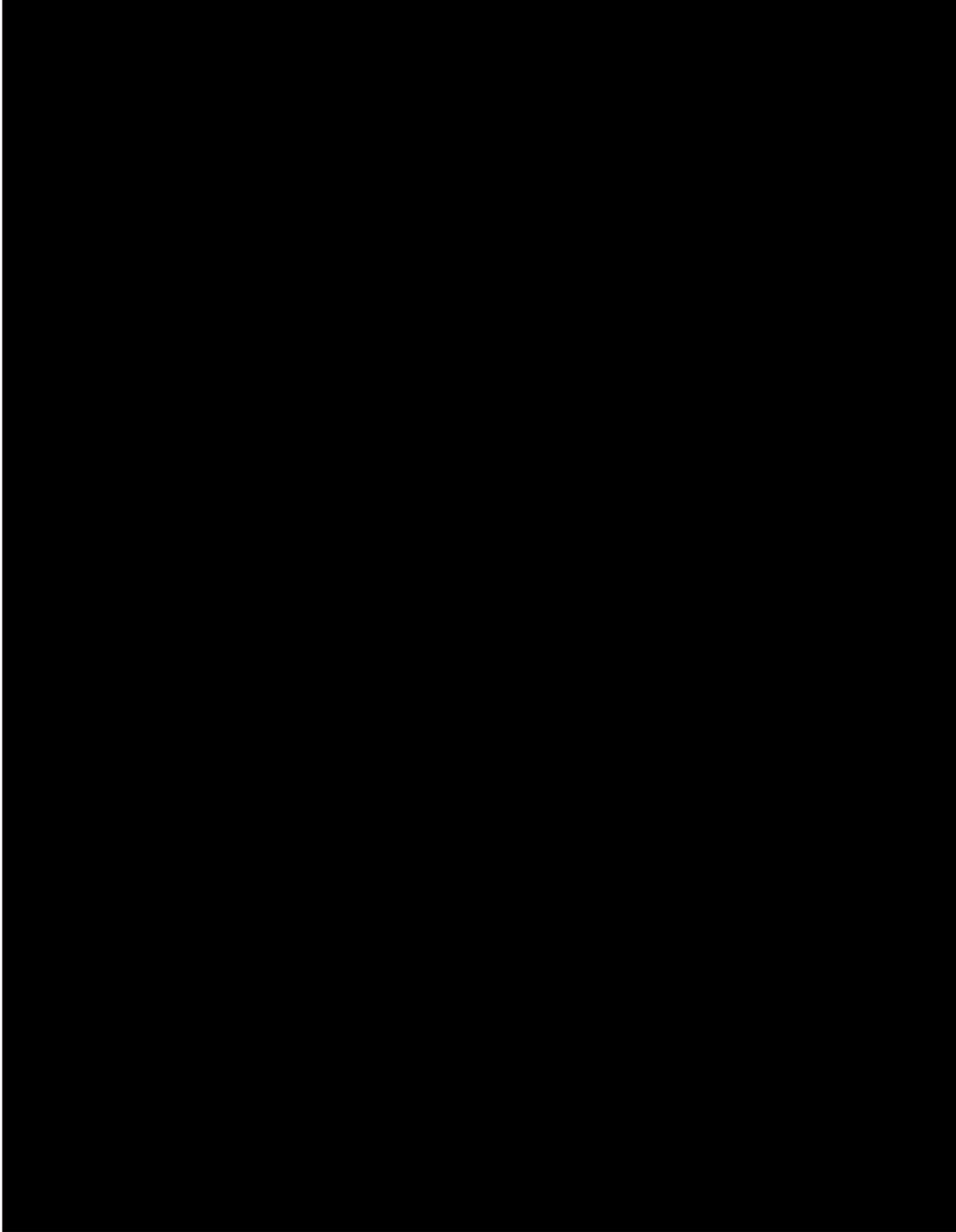
REDACTED Boston Gas Company and Colonial Gas Company
each d/b/a National Grid
D.P.U. 17-170
Attachment AG-21-39-41
Page 6 of 92



REDACTED

The Narragansett Electric Company
d/b/a National Grid
RIPUC Docket No. 4770
Attachment DIV 7-49-252
Page 7 of 92

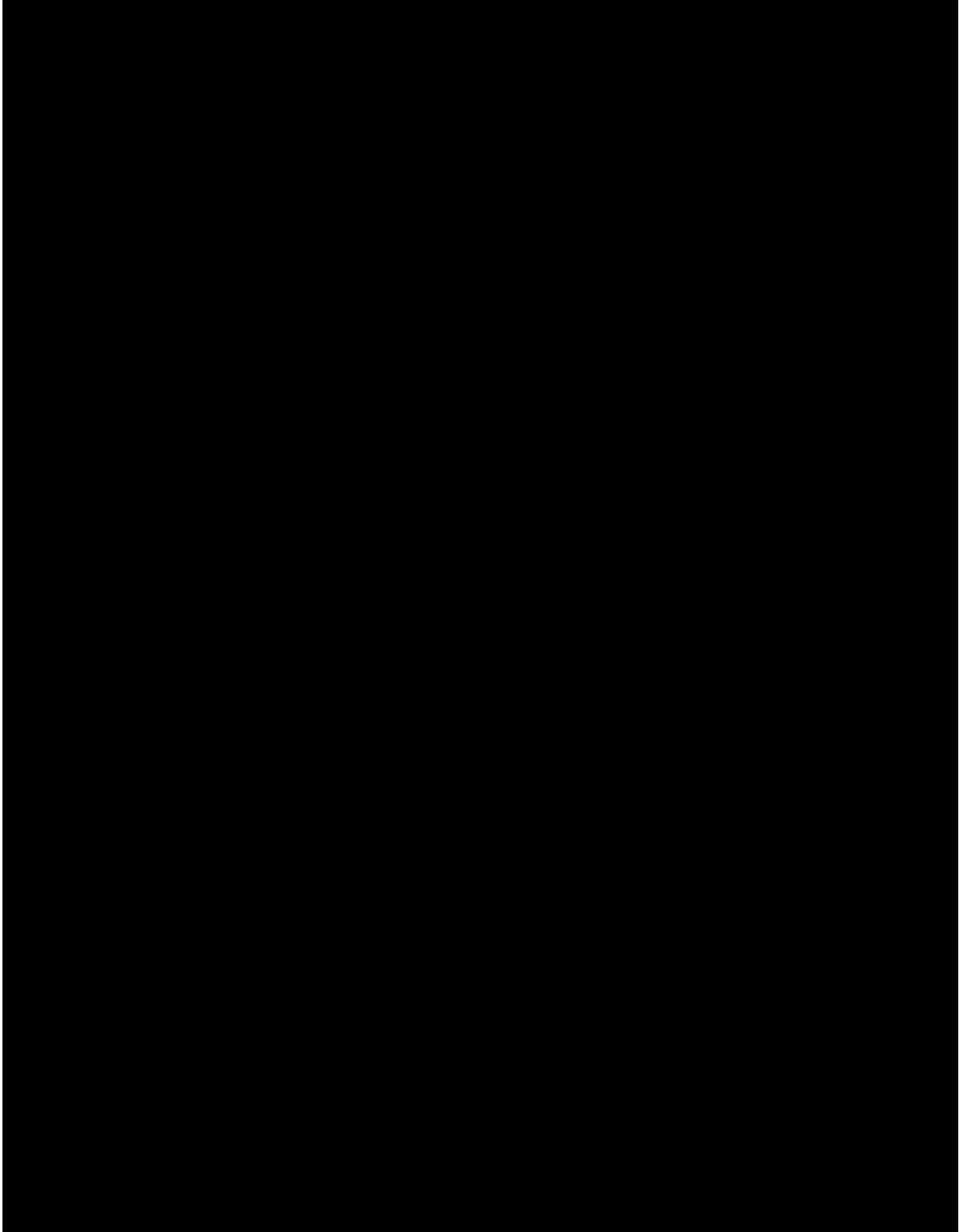
REDACTED Boston Gas Company and Colonial Gas Company
each d/b/a National Grid
D.P.U. 17-170
Attachment AG-21-39-41
Page 7 of 92



REDACTED

The Narragansett Electric Company
d/b/a National Grid
RIPUC Docket No. 4770
Attachment DIV 7-49-252
Page 8 of 92

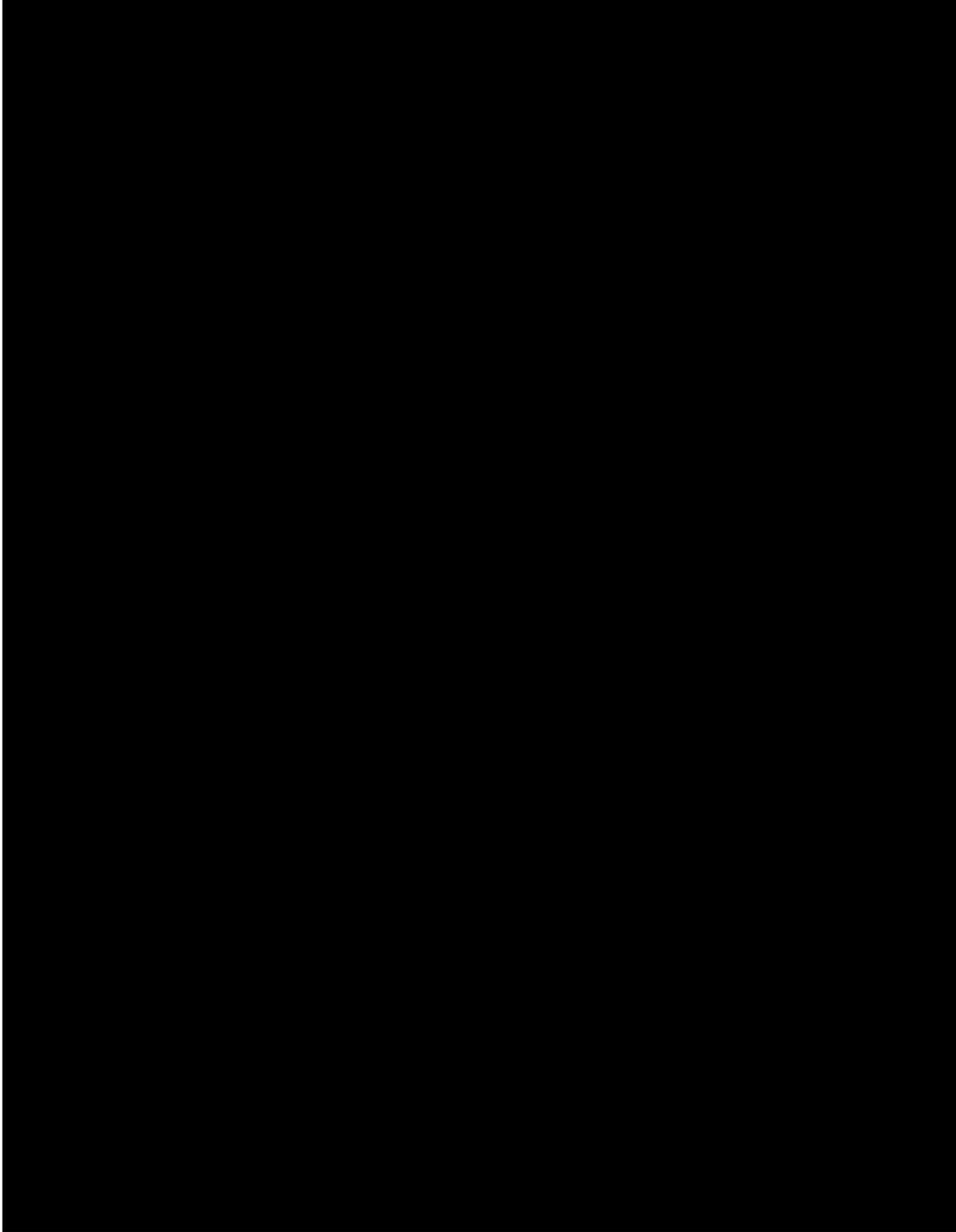
REDACTED Boston Gas Company and Colonial Gas Company
each d/b/a National Grid
D.P.U. 17-170
Attachment AG-21-39-41
Page 8 of 92



REDACTED

The Narragansett Electric Company
d/b/a National Grid
RIPUC Docket No. 4770
Attachment DIV 7-49-252
Page 9 of 92

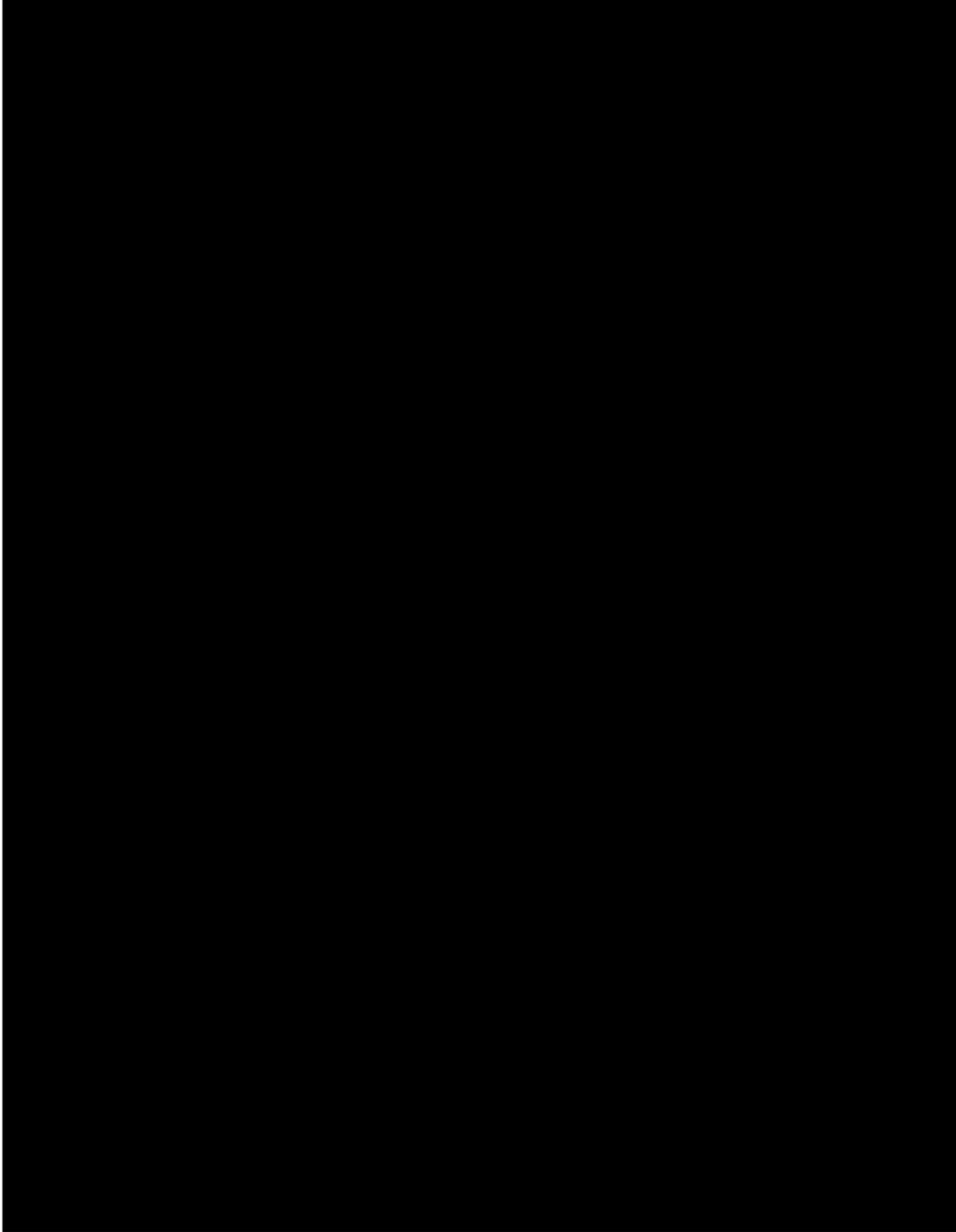
REDACTED Boston Gas Company and Colonial Gas Company
each d/b/a National Grid
D.P.U. 17-170
Attachment AG-21-39-41
Page 9 of 92



REDACTED

The Narragansett Electric Company
d/b/a National Grid
RIPUC Docket No. 4770
Attachment DIV 7-49-252
Page 10 of 92

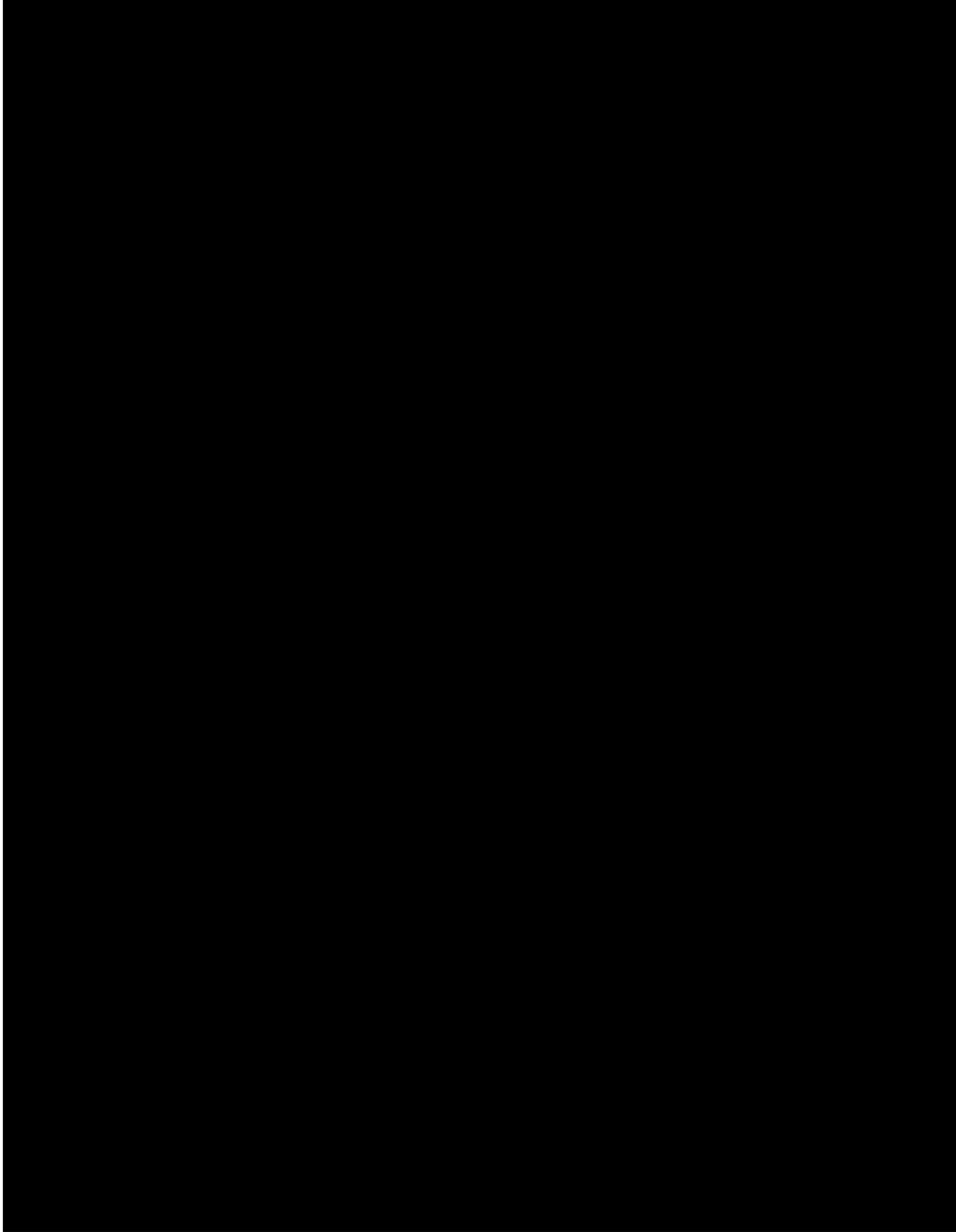
REDACTED Boston Gas Company and Colonial Gas Company
each d/b/a National Grid
D.P.U. 17-170
Attachment AG-21-39-41
Page 10 of 92



REDACTED

The Narragansett Electric Company
d/b/a National Grid
RIPUC Docket No. 4770
Attachment DIV 7-49-252
Page 11 of 92

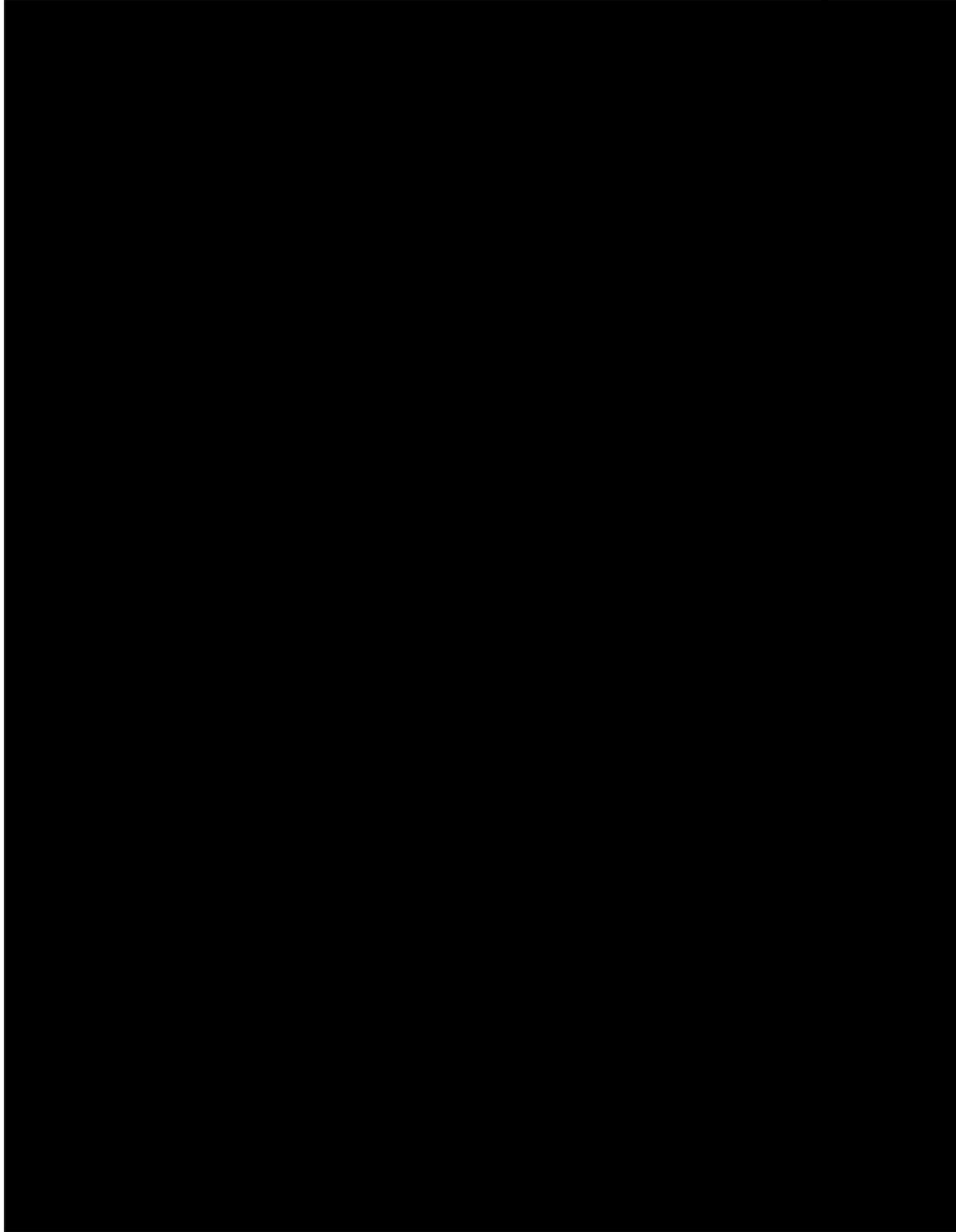
REDACTED Boston Gas Company and Colonial Gas Company
each d/b/a National Grid
D.P.U. 17-170
Attachment AG-21-39-41
Page 11 of 92



REDACTED

The Narragansett Electric Company
d/b/a National Grid
RIPUC Docket No. 4770
Attachment DIV 7-49-252
Page 12 of 92

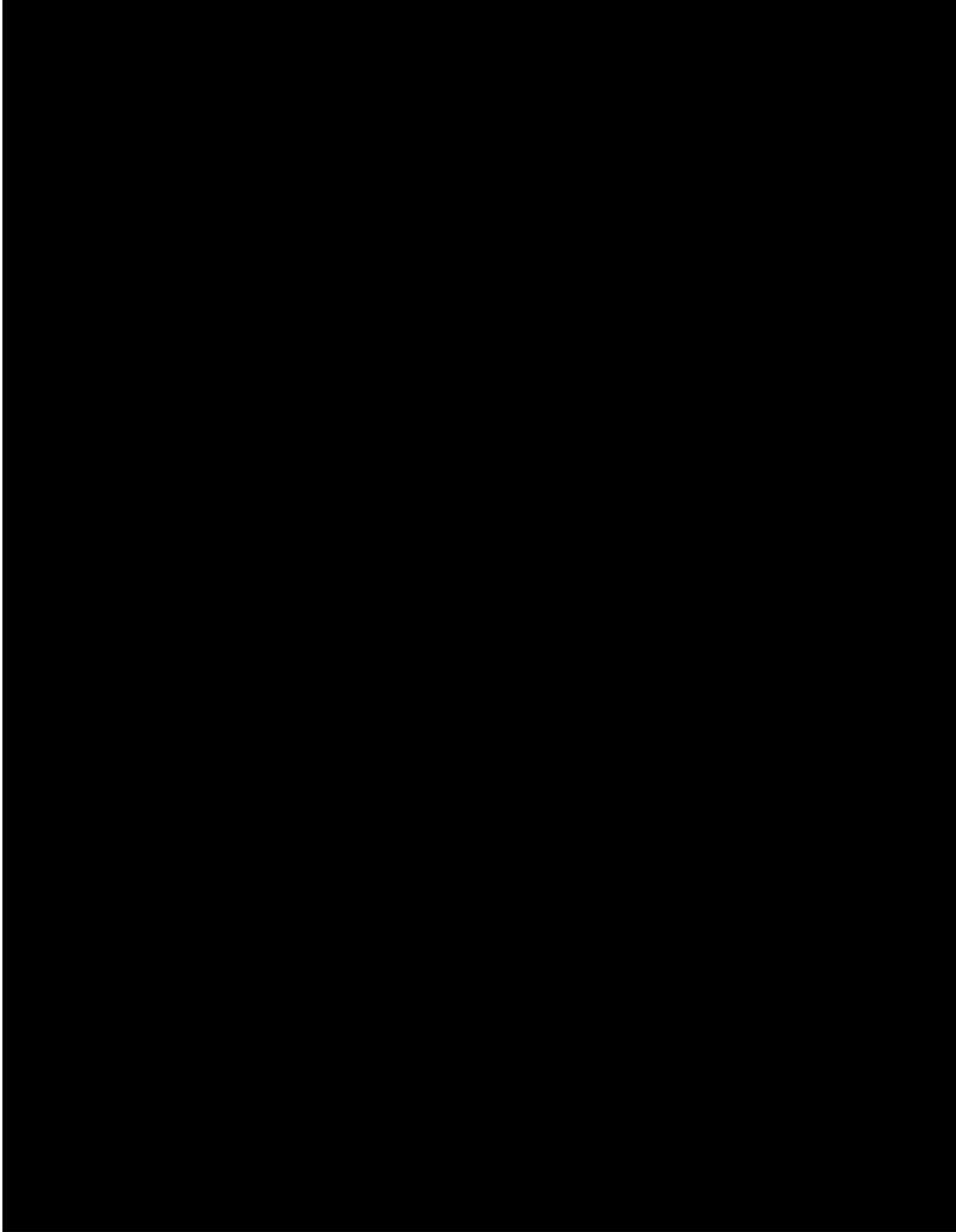
REDACTED Boston Gas Company and Colonial Gas Company
each d/b/a National Grid
D.P.U. 17-170
Attachment AG-21-39-41
Page 12 of 92



REDACTED

The Narragansett Electric Company
d/b/a National Grid
RIPUC Docket No. 4770
Attachment DIV 7-49-252
Page 13 of 92

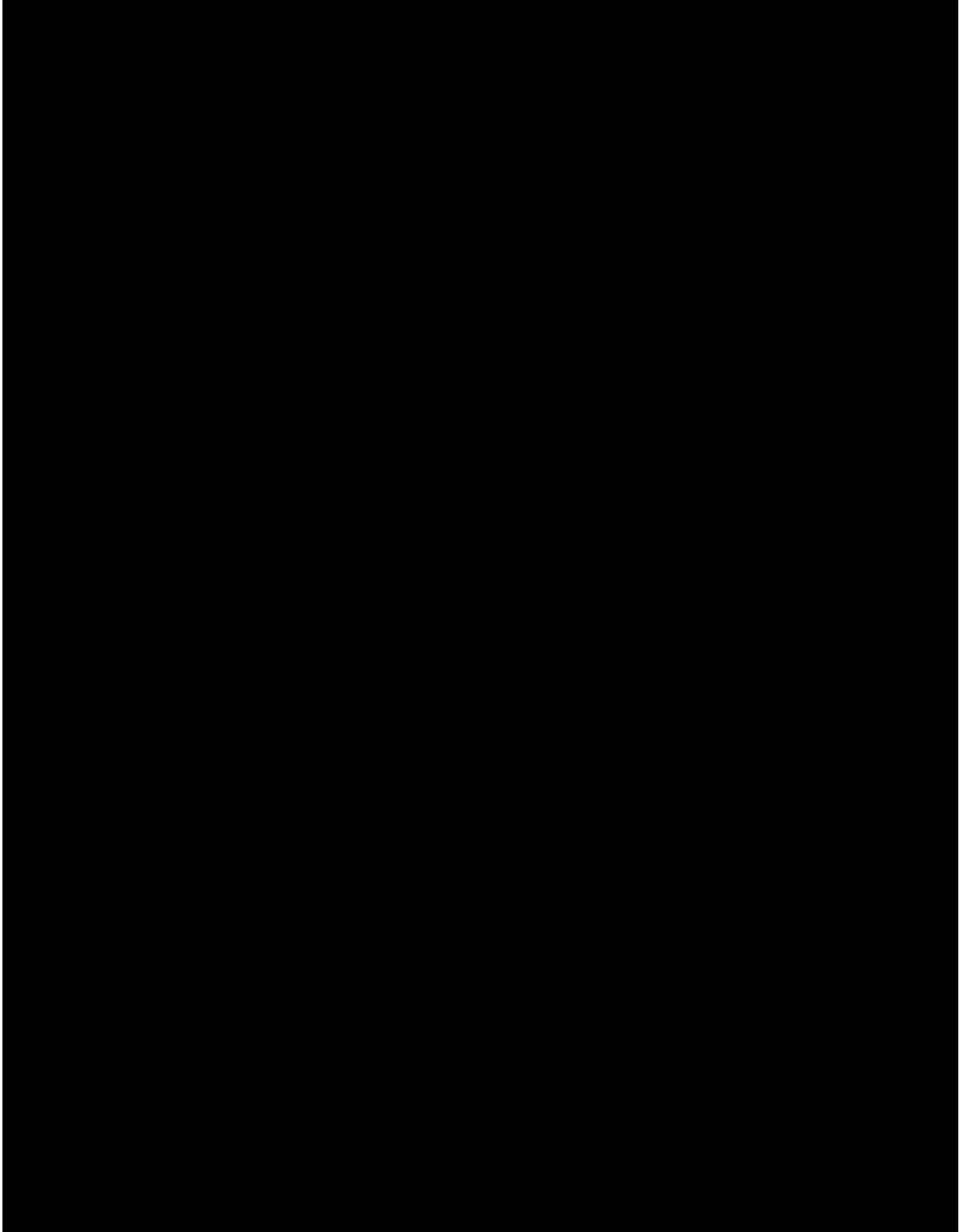
REDACTED Boston Gas Company and Colonial Gas Company
each d/b/a National Grid
D.P.U. 17-170
Attachment AG-21-39-41
Page 13 of 92



REDACTED

The Narragansett Electric Company
d/b/a National Grid
RIPUC Docket No. 4770
Attachment DIV 7-49-252
Page 14 of 92

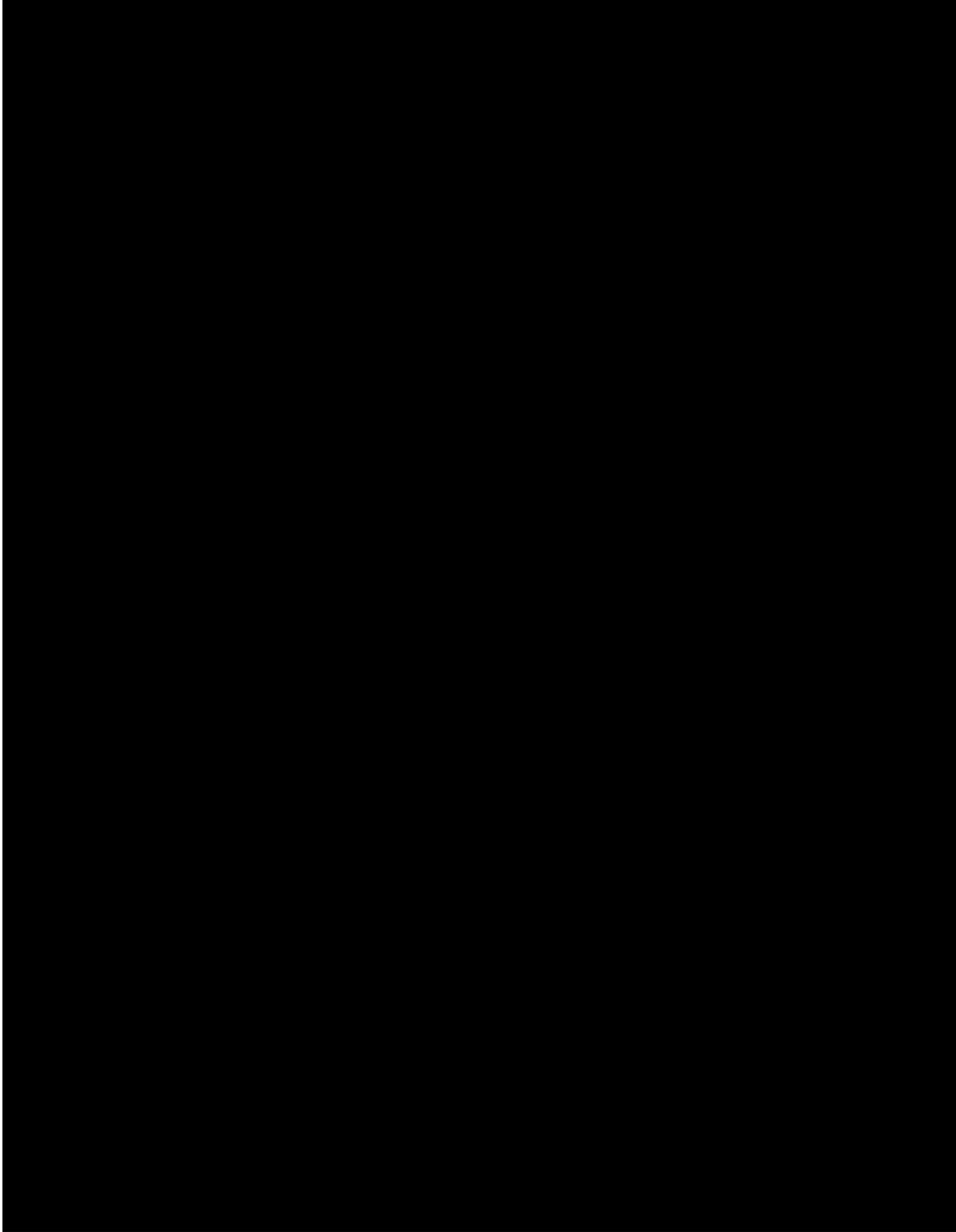
REDACTED Boston Gas Company and Colonial Gas Company
each d/b/a National Grid
D.P.U. 17-170
Attachment AG-21-39-41
Page 14 of 92



REDACTED

The Narragansett Electric Company
d/b/a National Grid
RIPUC Docket No. 4770
Attachment DIV 7-49-252
Page 15 of 92

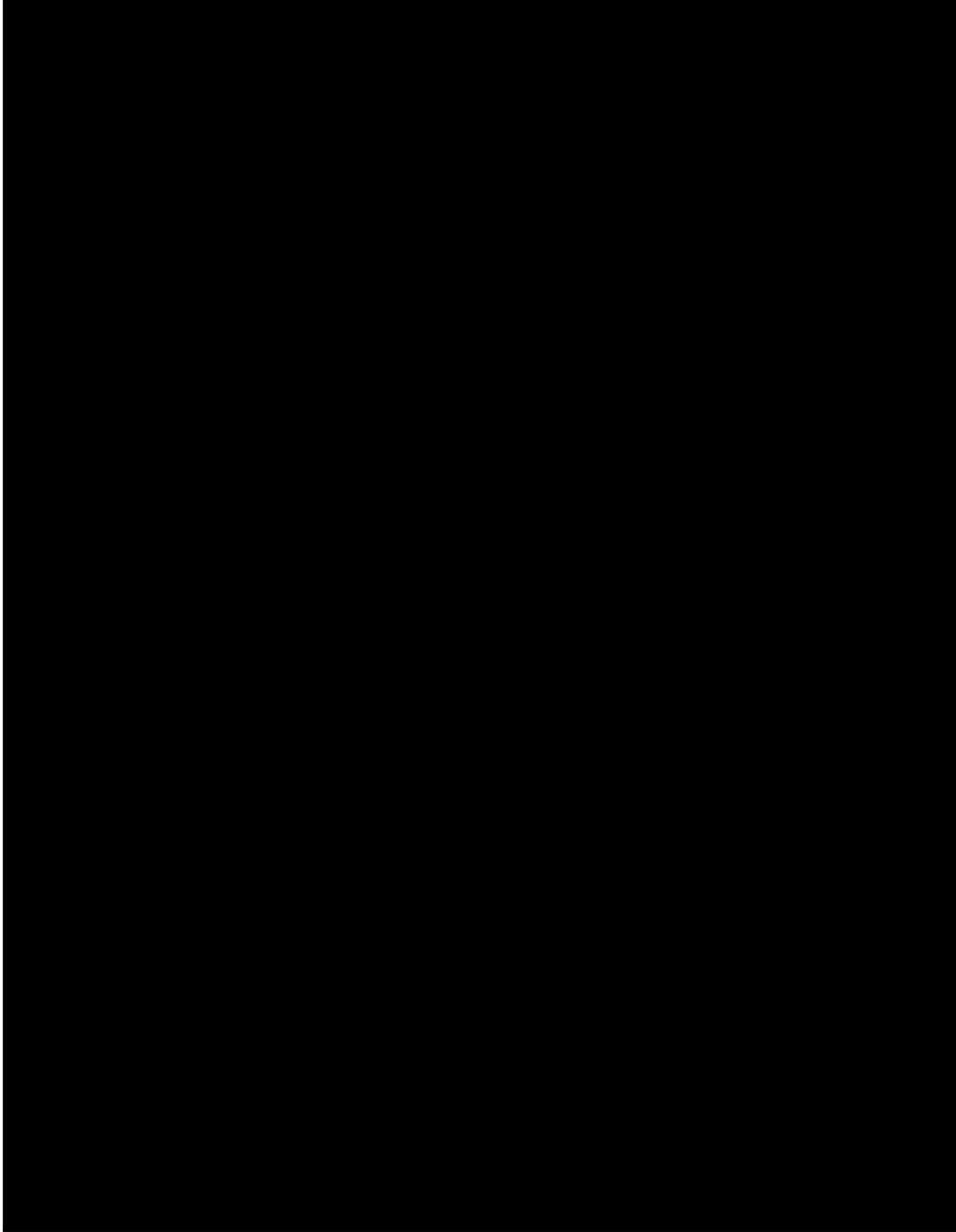
REDACTED Boston Gas Company and Colonial Gas Company
each d/b/a National Grid
D.P.U. 17-170
Attachment AG-21-39-41
Page 15 of 92



REDACTED

The Narragansett Electric Company
d/b/a National Grid
RIPUC Docket No. 4770
Attachment DIV 7-49-252
Page 16 of 92

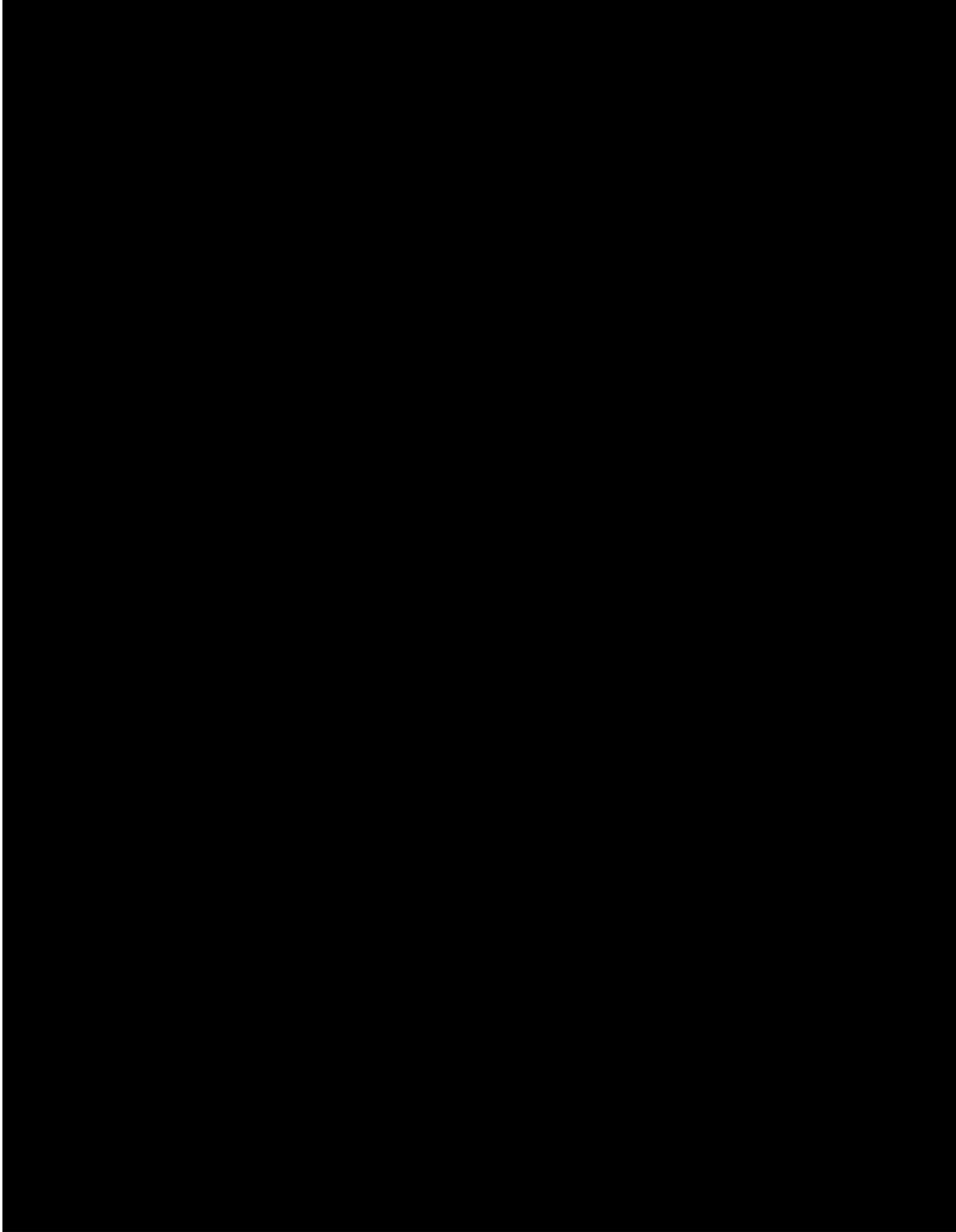
REDACTED Boston Gas Company and Colonial Gas Company
each d/b/a National Grid
D.P.U. 17-170
Attachment AG-21-39-41
Page 16 of 92



REDACTED

The Narragansett Electric Company
d/b/a National Grid
RIPUC Docket No. 4770
Attachment DIV 7-49-252
Page 17 of 92

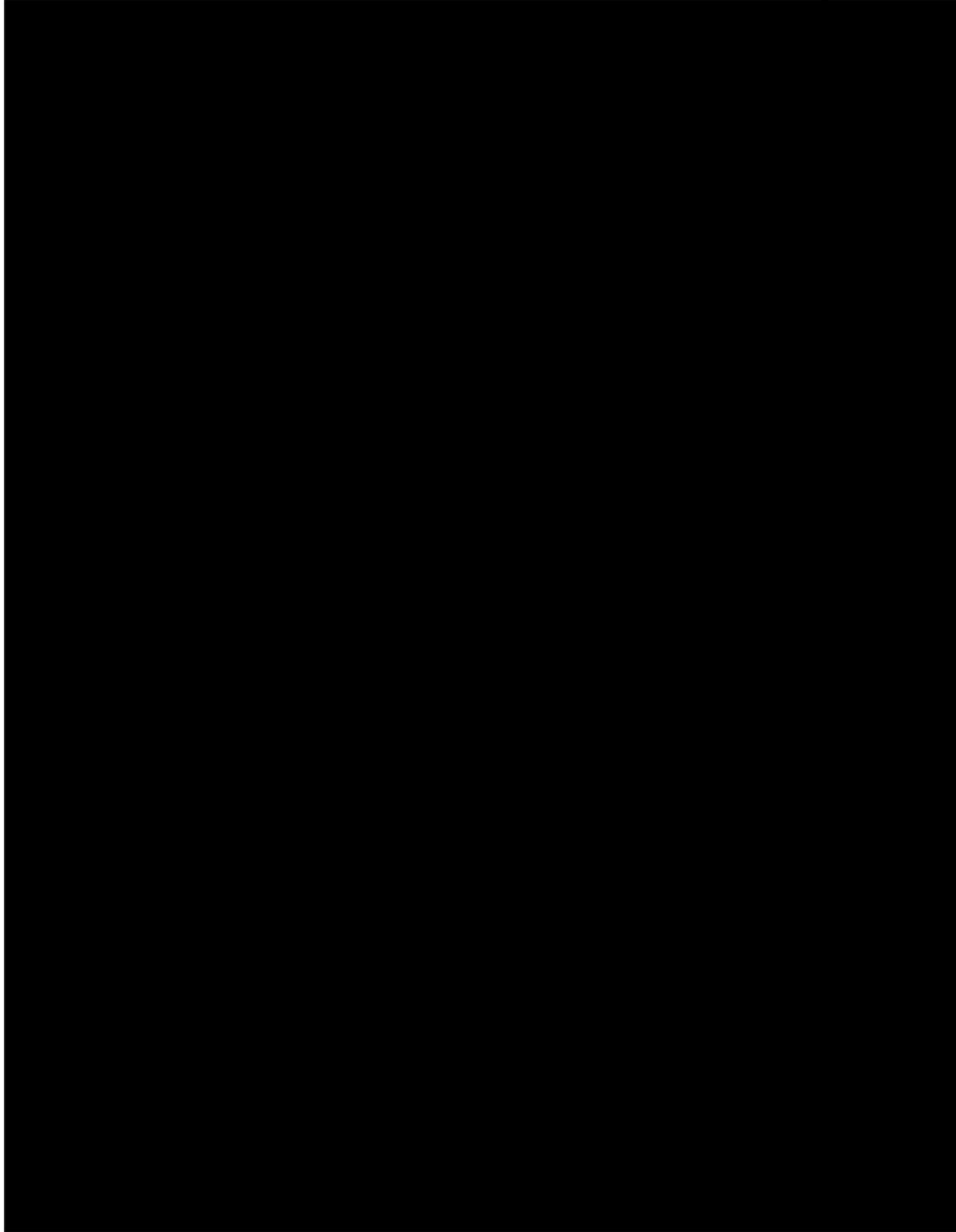
REDACTED Boston Gas Company and Colonial Gas Company
each d/b/a National Grid
D.P.U. 17-170
Attachment AG-21-39-41
Page 17 of 92



REDACTED

The Narragansett Electric Company
d/b/a National Grid
RIPUC Docket No. 4770
Attachment DIV 7-49-252
Page 18 of 92

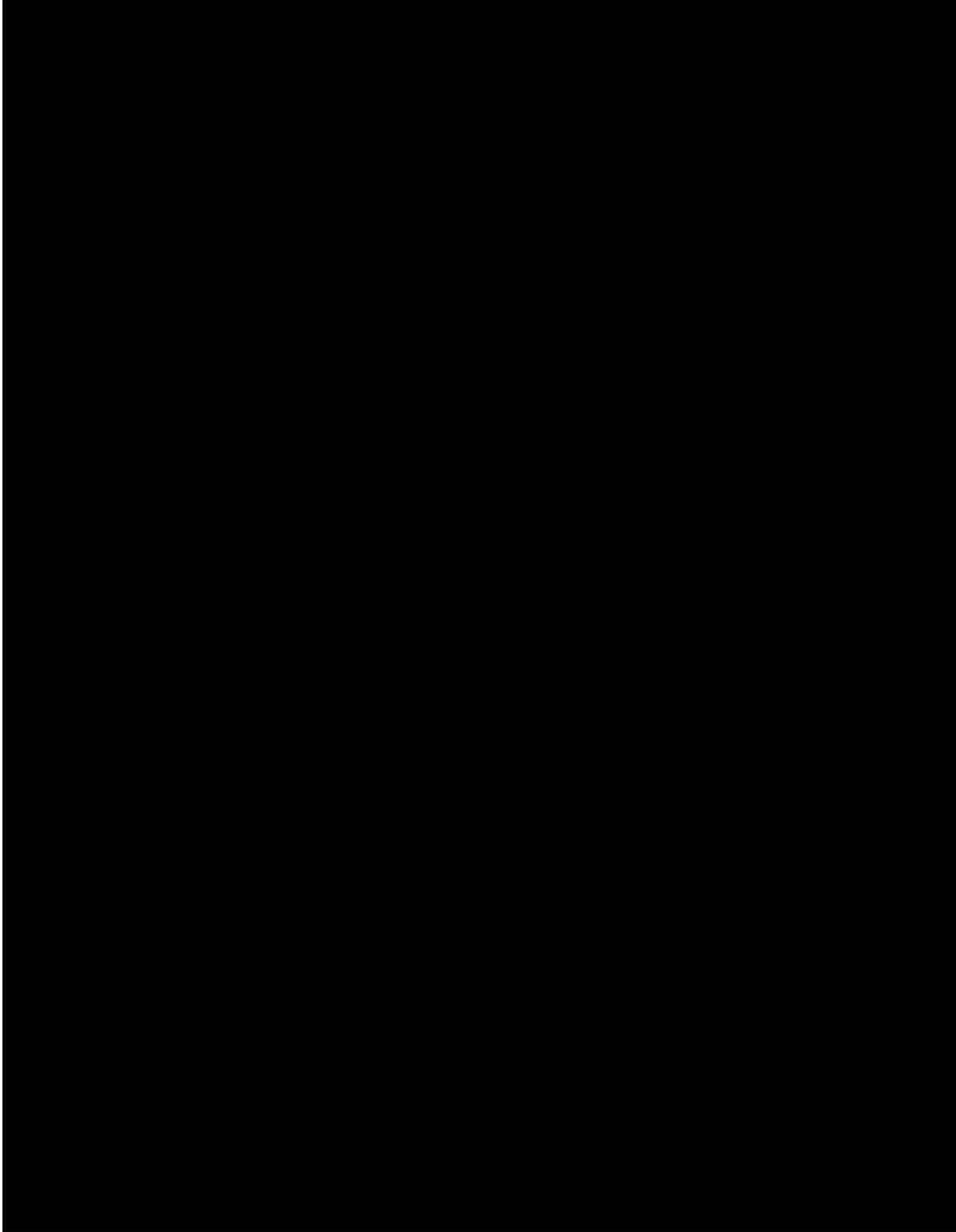
REDACTED Boston Gas Company and Colonial Gas Company
each d/b/a National Grid
D.P.U. 17-170
Attachment AG-21-39-41
Page 18 of 92



REDACTED

The Narragansett Electric Company
d/b/a National Grid
RIPUC Docket No. 4770
Attachment DIV 7-49-252
Page 19 of 92

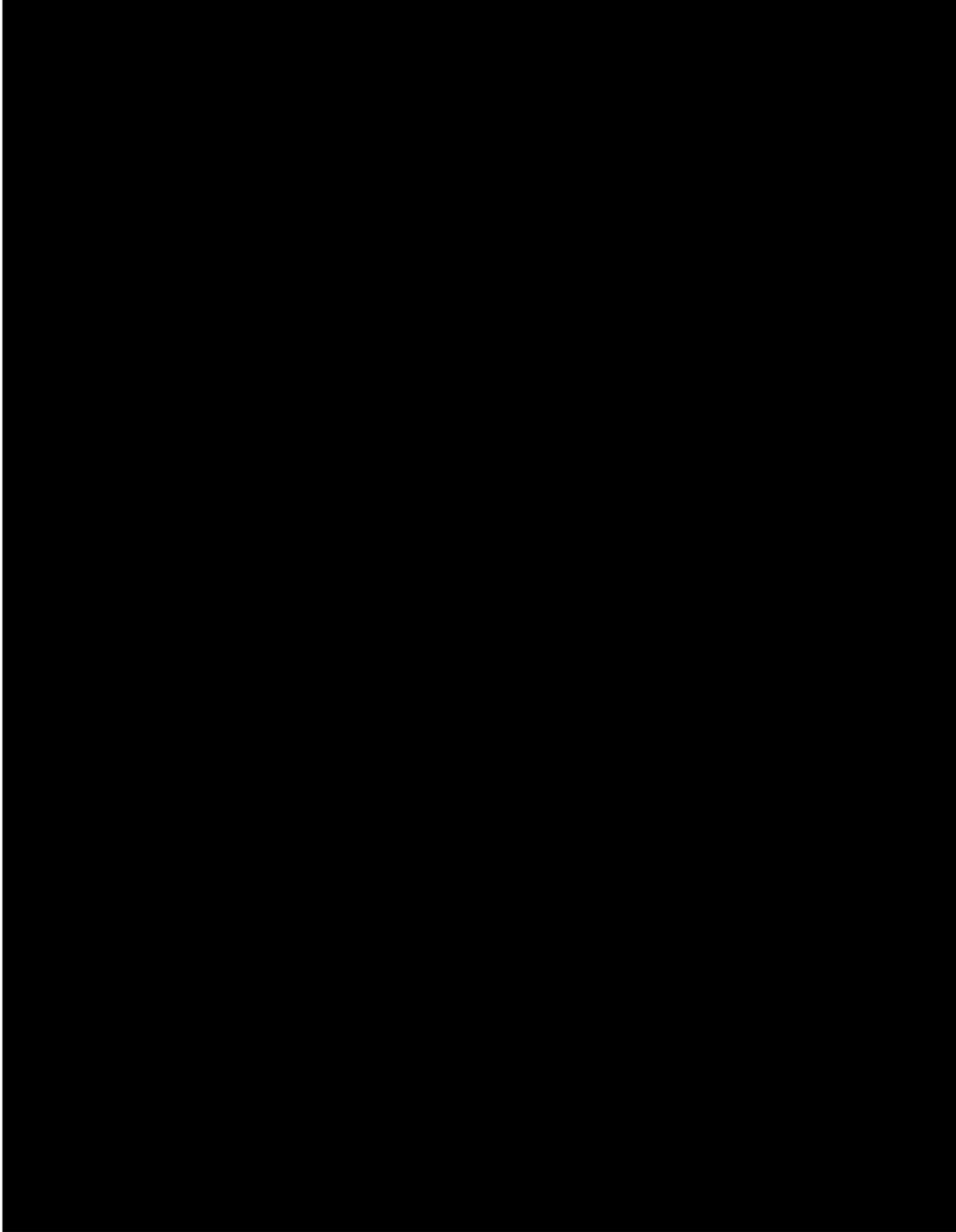
REDACTED Boston Gas Company and Colonial Gas Company
each d/b/a National Grid
D.P.U. 17-170
Attachment AG-21-39-41
Page 19 of 92



REDACTED

The Narragansett Electric Company
d/b/a National Grid
RIPUC Docket No. 4770
Attachment DIV 7-49-252
Page 20 of 92

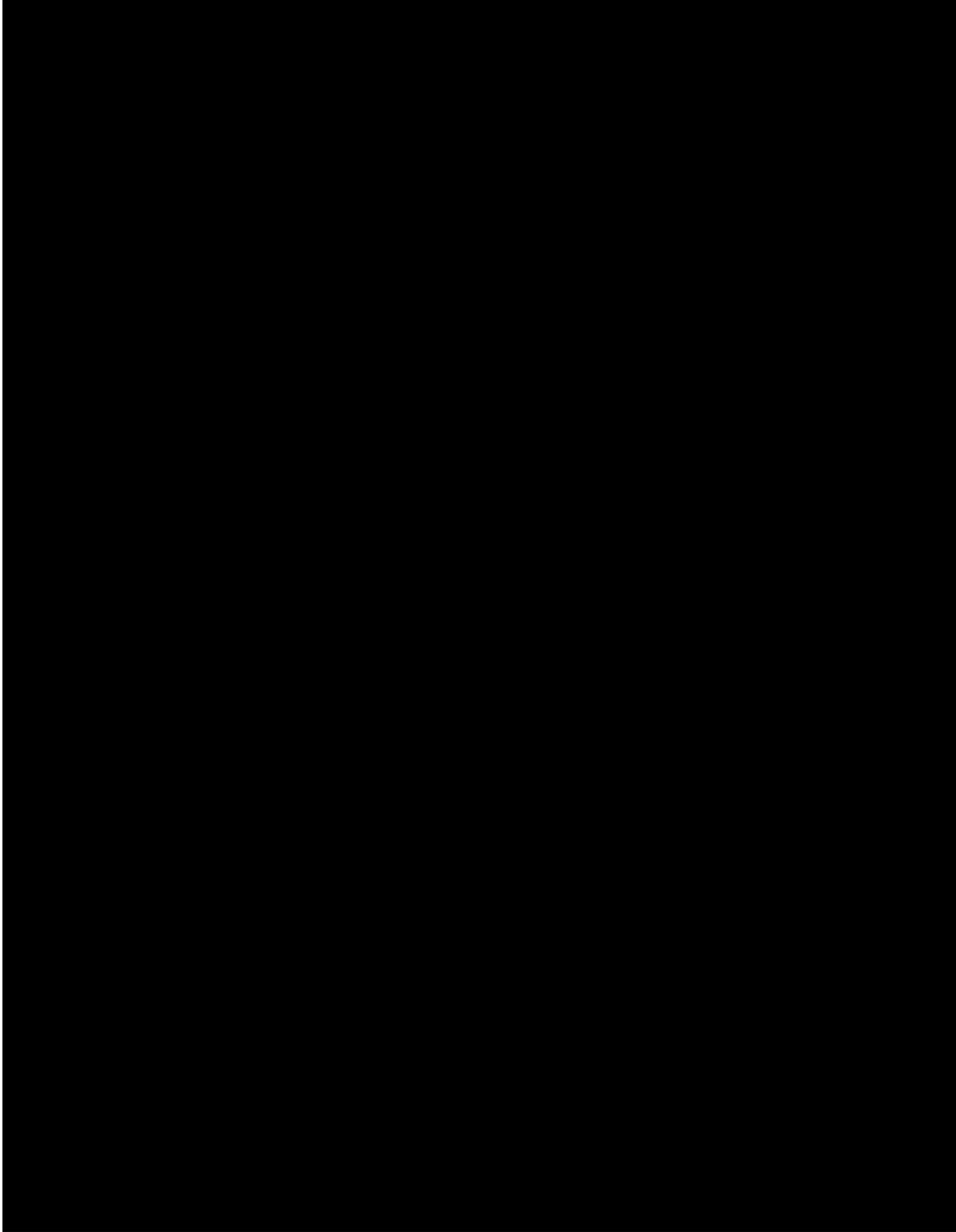
REDACTED Boston Gas Company and Colonial Gas Company
each d/b/a National Grid
D.P.U. 17-170
Attachment AG-21-39-41
Page 20 of 92



REDACTED

The Narragansett Electric Company
d/b/a National Grid
RIPUC Docket No. 4770
Attachment DIV 7-49-252
Page 21 of 92

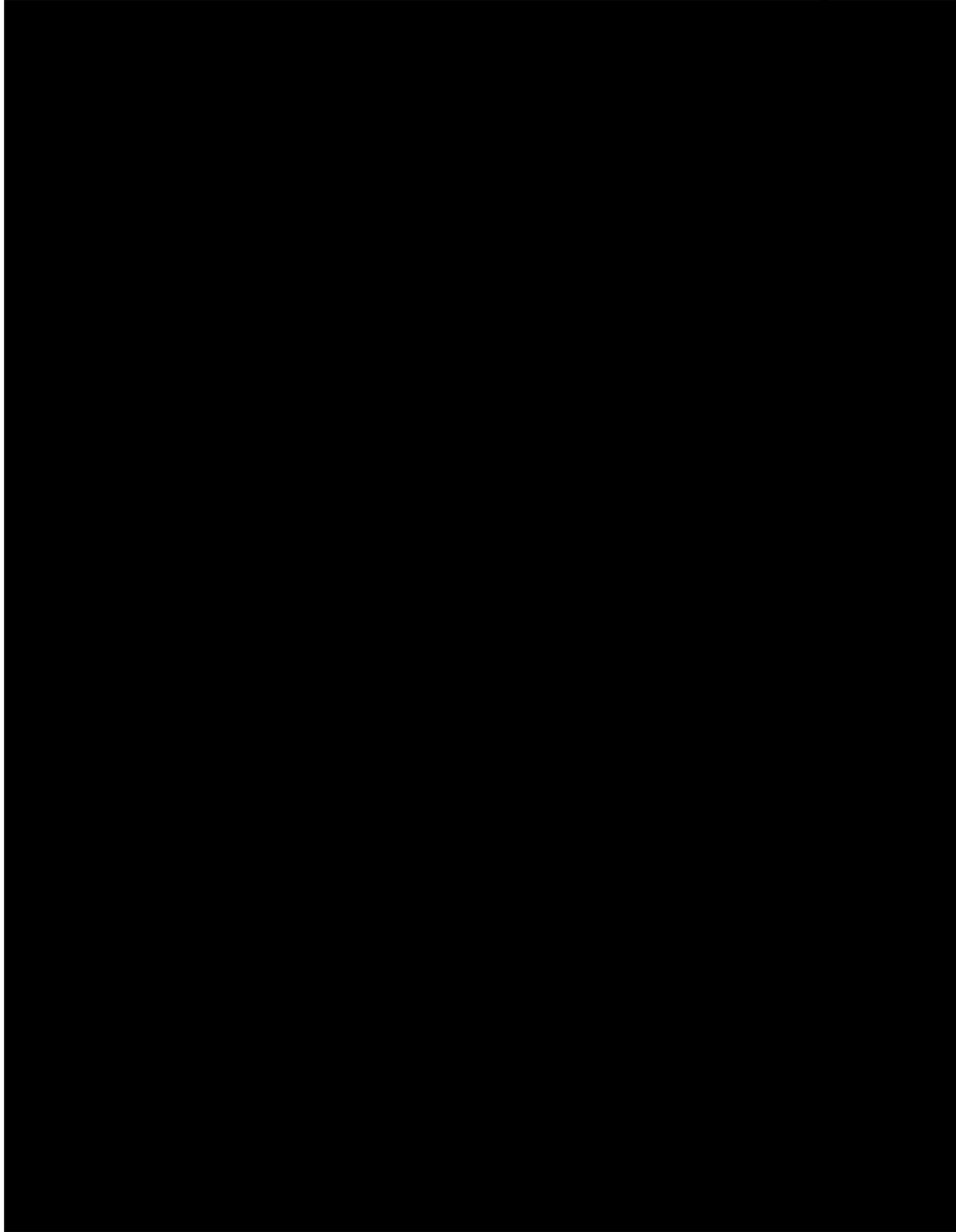
REDACTED Boston Gas Company and Colonial Gas Company
each d/b/a National Grid
D.P.U. 17-170
Attachment AG-21-39-41
Page 21 of 92



REDACTED

The Narragansett Electric Company
d/b/a National Grid
RIPUC Docket No. 4770
Attachment DIV 7-49-252
Page 22 of 92

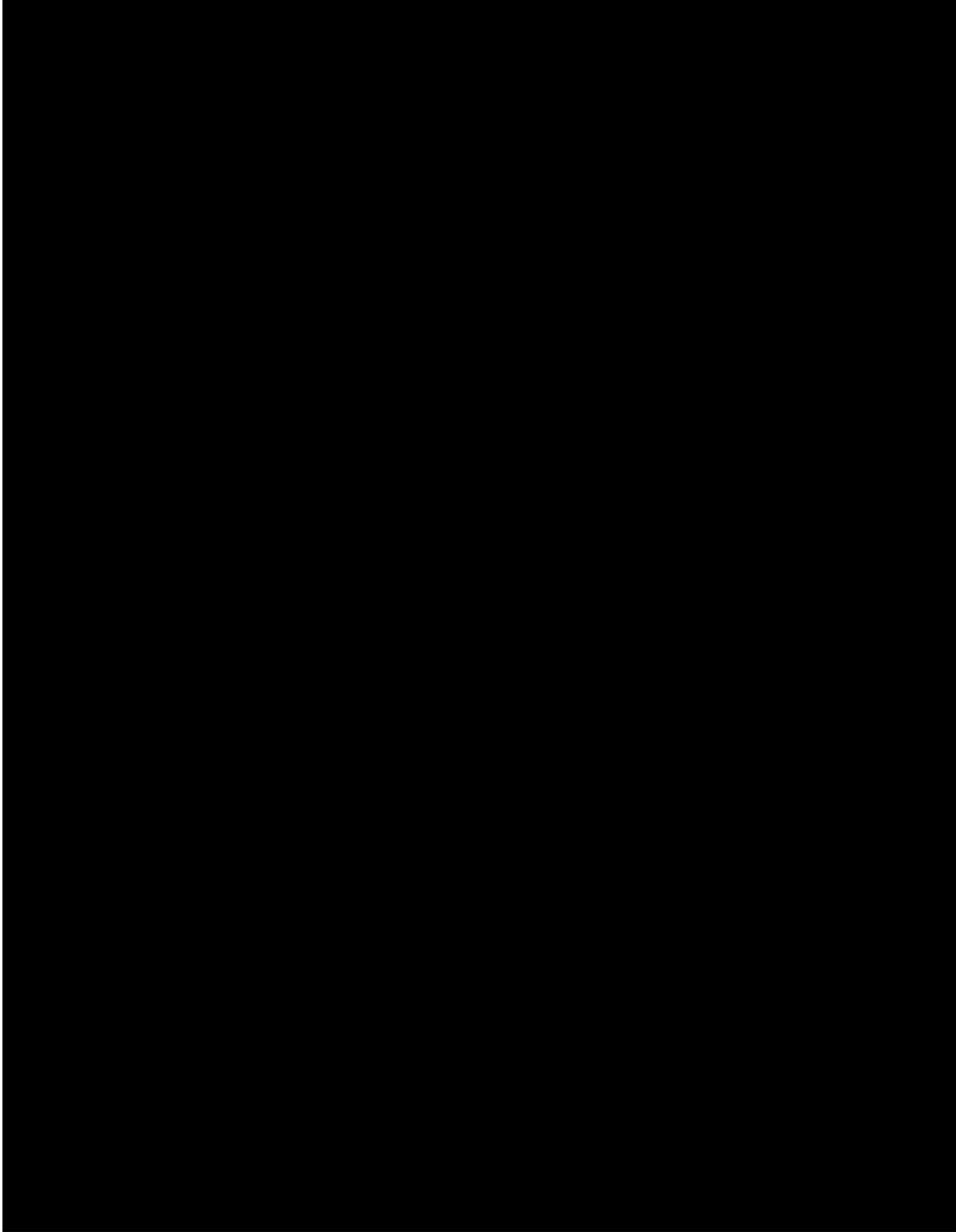
REDACTED Boston Gas Company and Colonial Gas Company
each d/b/a National Grid
D.P.U. 17-170
Attachment AG-21-39-41
Page 22 of 92



REDACTED

The Narragansett Electric Company
d/b/a National Grid
RIPUC Docket No. 4770
Attachment DIV 7-49-252
Page 23 of 92

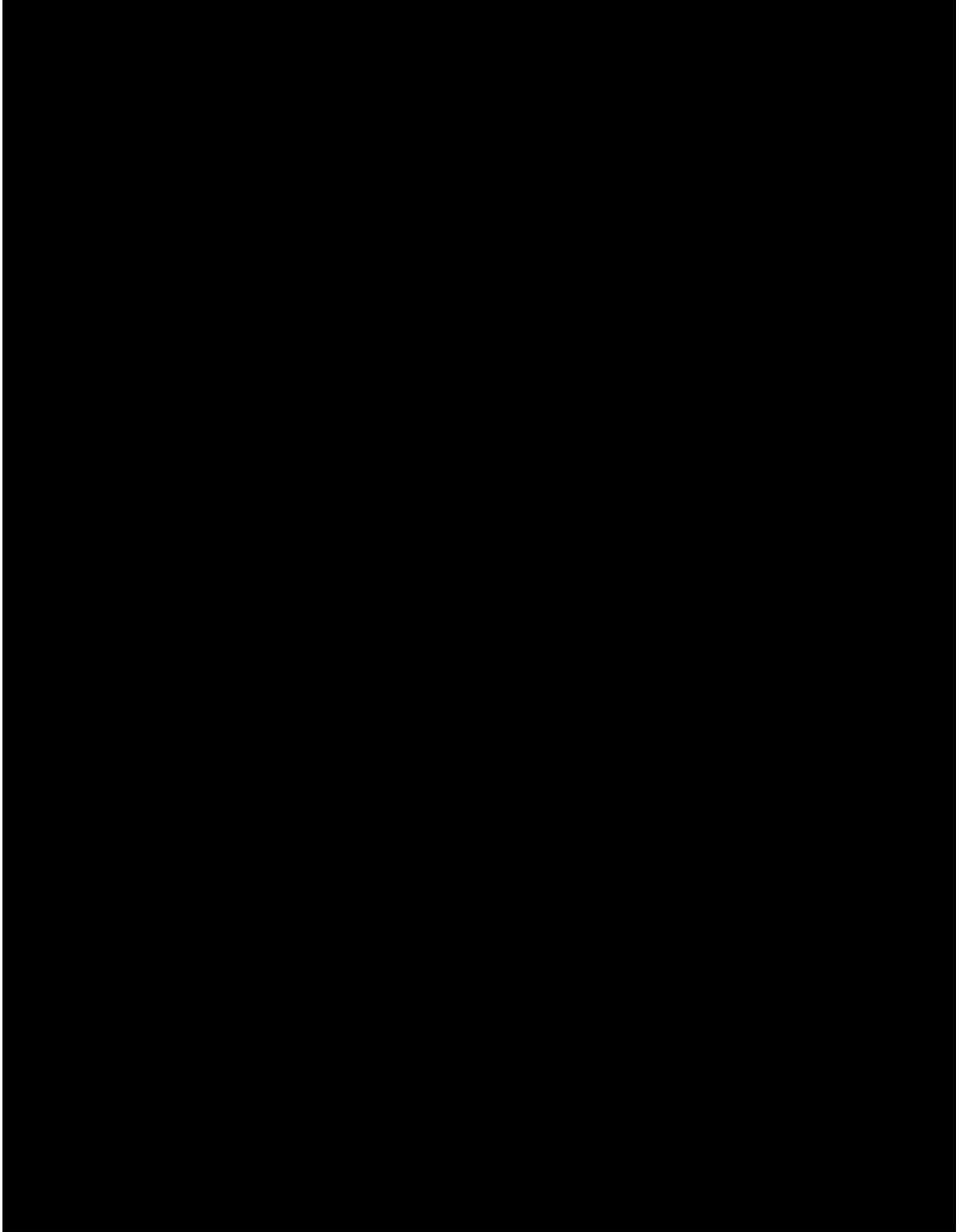
REDACTED Boston Gas Company and Colonial Gas Company
each d/b/a National Grid
D.P.U. 17-170
Attachment AG-21-39-41
Page 23 of 92



REDACTED

The Narragansett Electric Company
d/b/a National Grid
RIPUC Docket No. 4770
Attachment DIV 7-49-252
Page 24 of 92

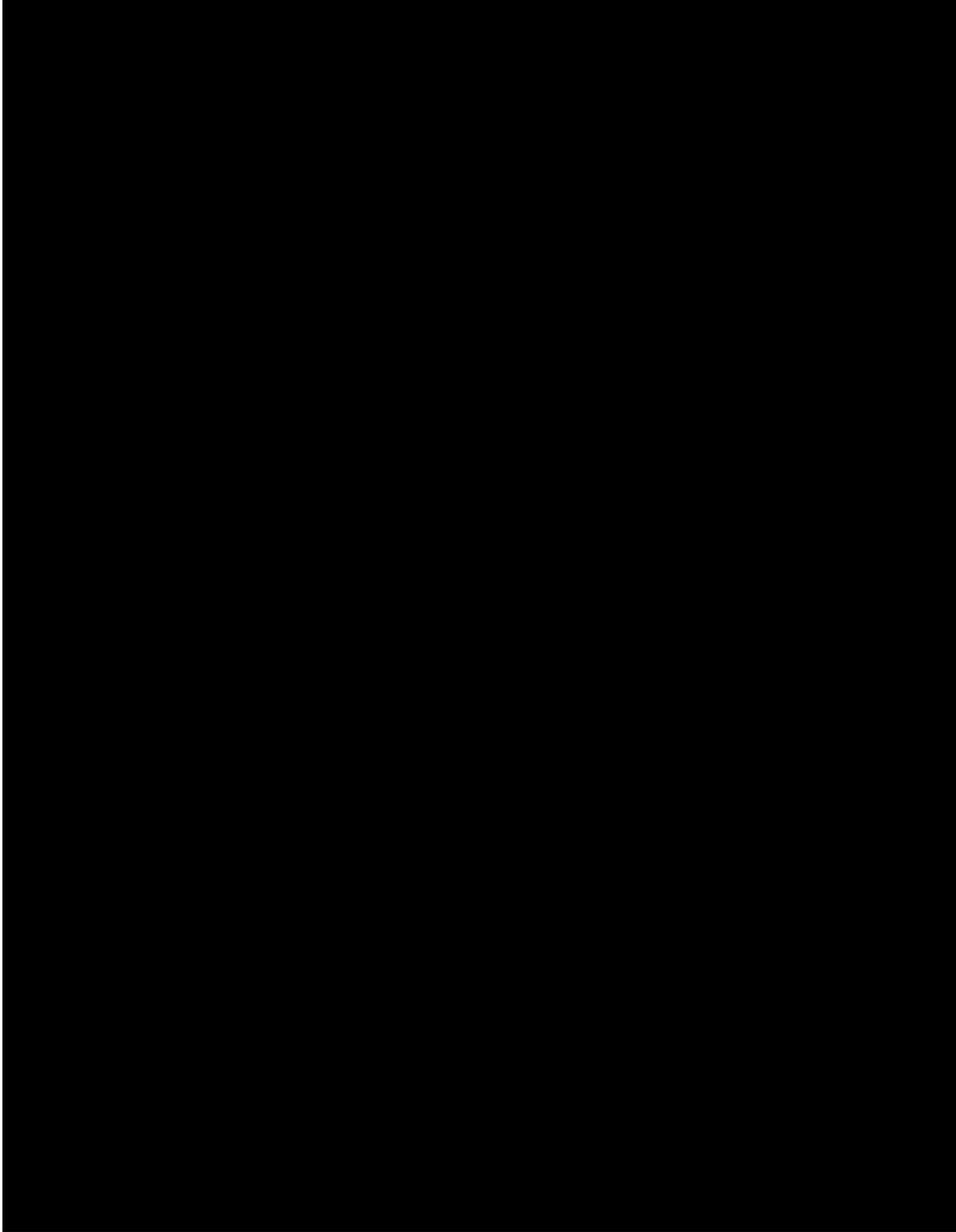
REDACTED Boston Gas Company and Colonial Gas Company
each d/b/a National Grid
D.P.U. 17-170
Attachment AG-21-39-41
Page 24 of 92



REDACTED

The Narragansett Electric Company
d/b/a National Grid
RIPUC Docket No. 4770
Attachment DIV 7-49-252
Page 25 of 92

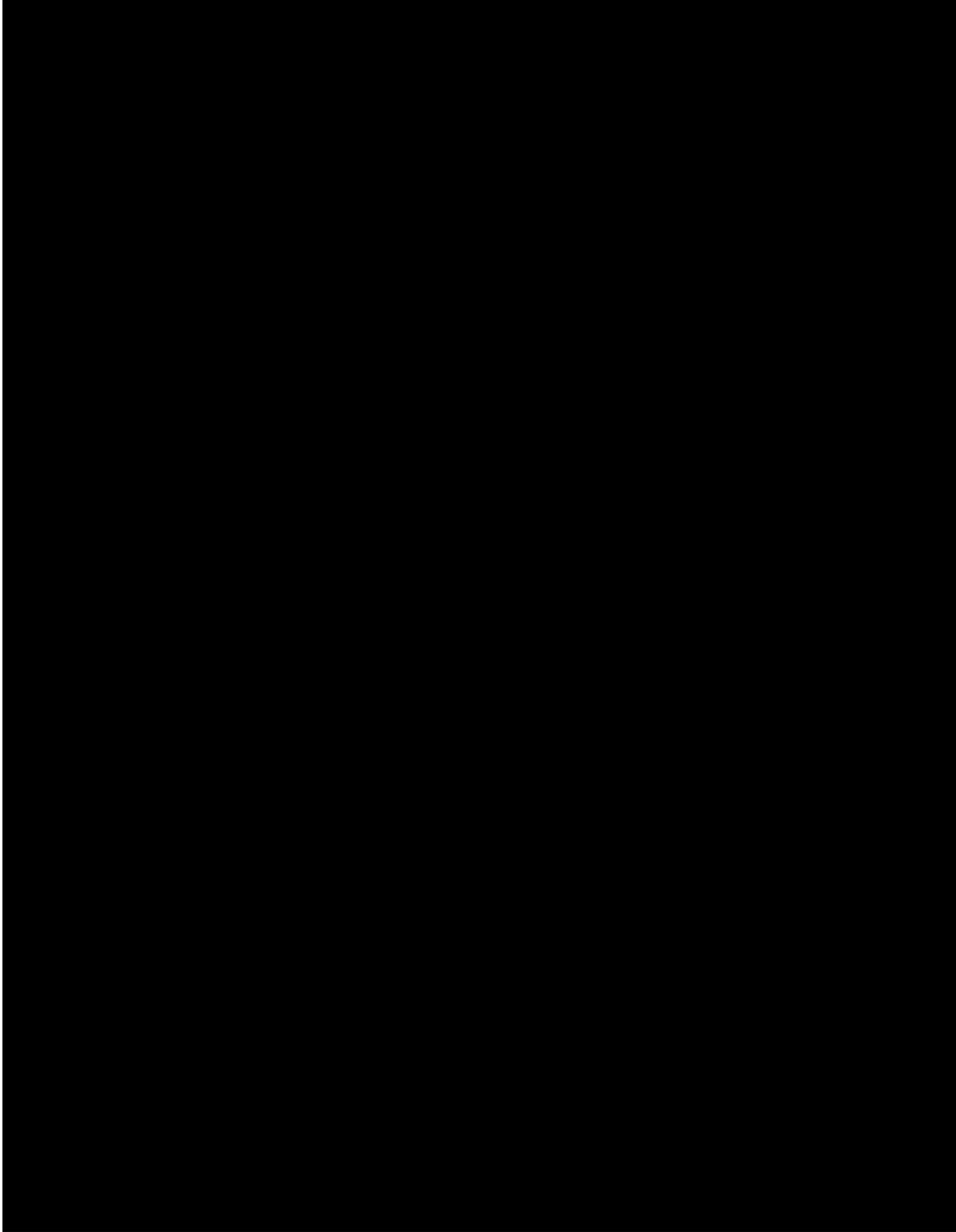
REDACTED Boston Gas Company and Colonial Gas Company
each d/b/a National Grid
D.P.U. 17-170
Attachment AG-21-39-41
Page 25 of 92



REDACTED

The Narragansett Electric Company
d/b/a National Grid
RIPUC Docket No. 4770
Attachment DIV 7-49-252
Page 26 of 92

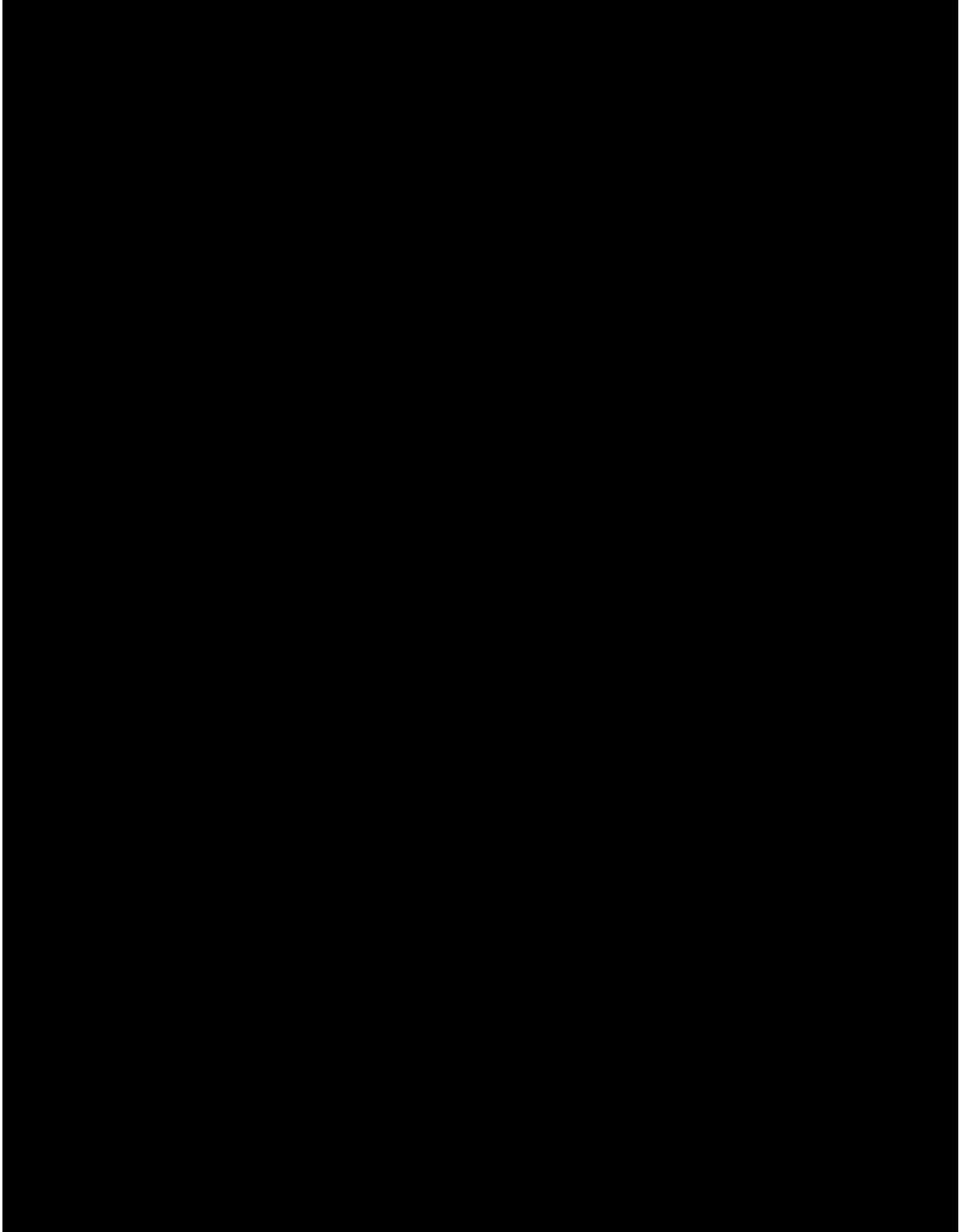
REDACTED Boston Gas Company and Colonial Gas Company
each d/b/a National Grid
D.P.U. 17-170
Attachment AG-21-39-41
Page 26 of 92



REDACTED

The Narragansett Electric Company
d/b/a National Grid
RIPUC Docket No. 4770
Attachment DIV 7-49-252
Page 27 of 92

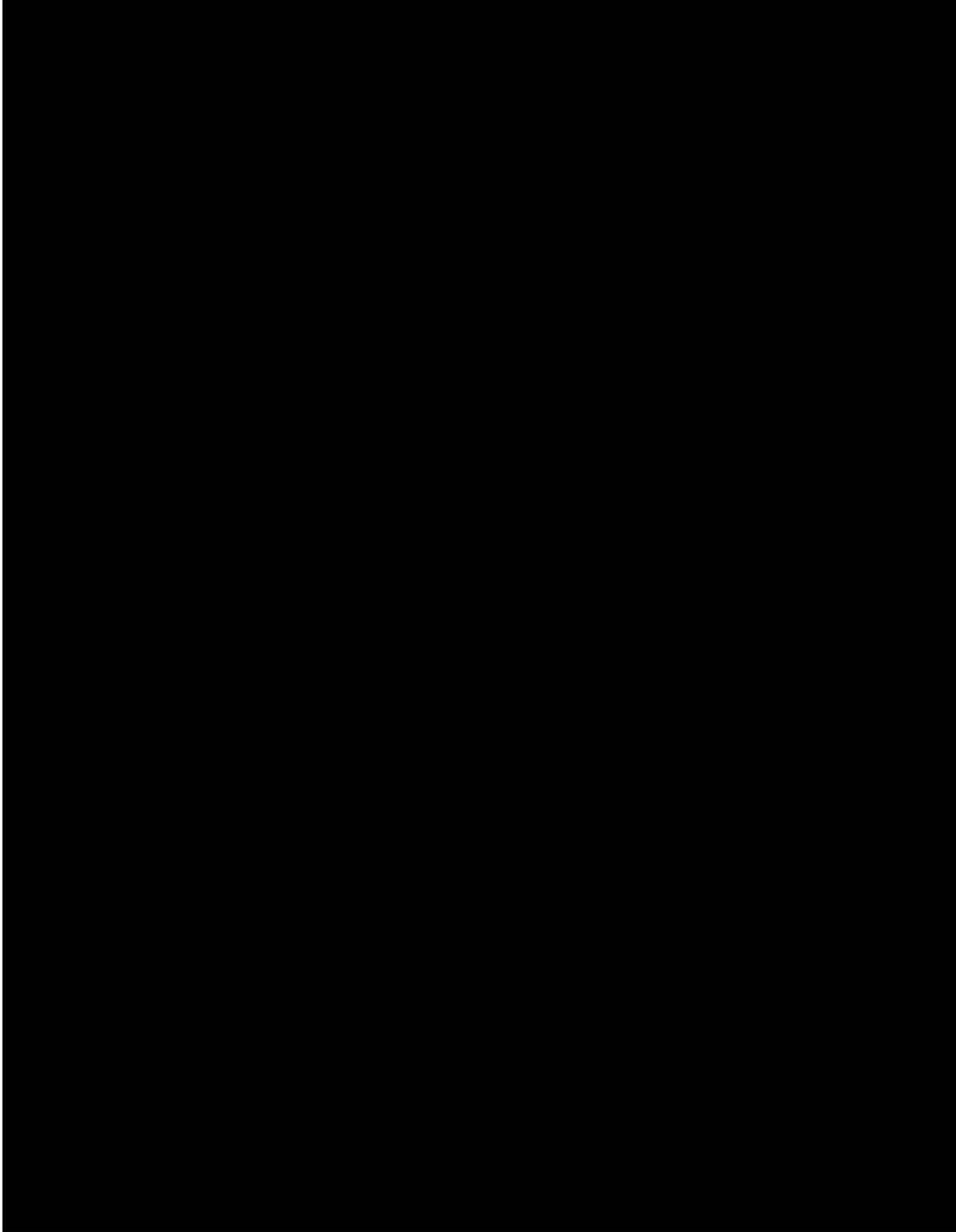
REDACTED Boston Gas Company and Colonial Gas Company
each d/b/a National Grid
D.P.U. 17-170
Attachment AG-21-39-41
Page 27 of 92



REDACTED

The Narragansett Electric Company
d/b/a National Grid
RIPUC Docket No. 4770
Attachment DIV 7-49-252
Page 28 of 92

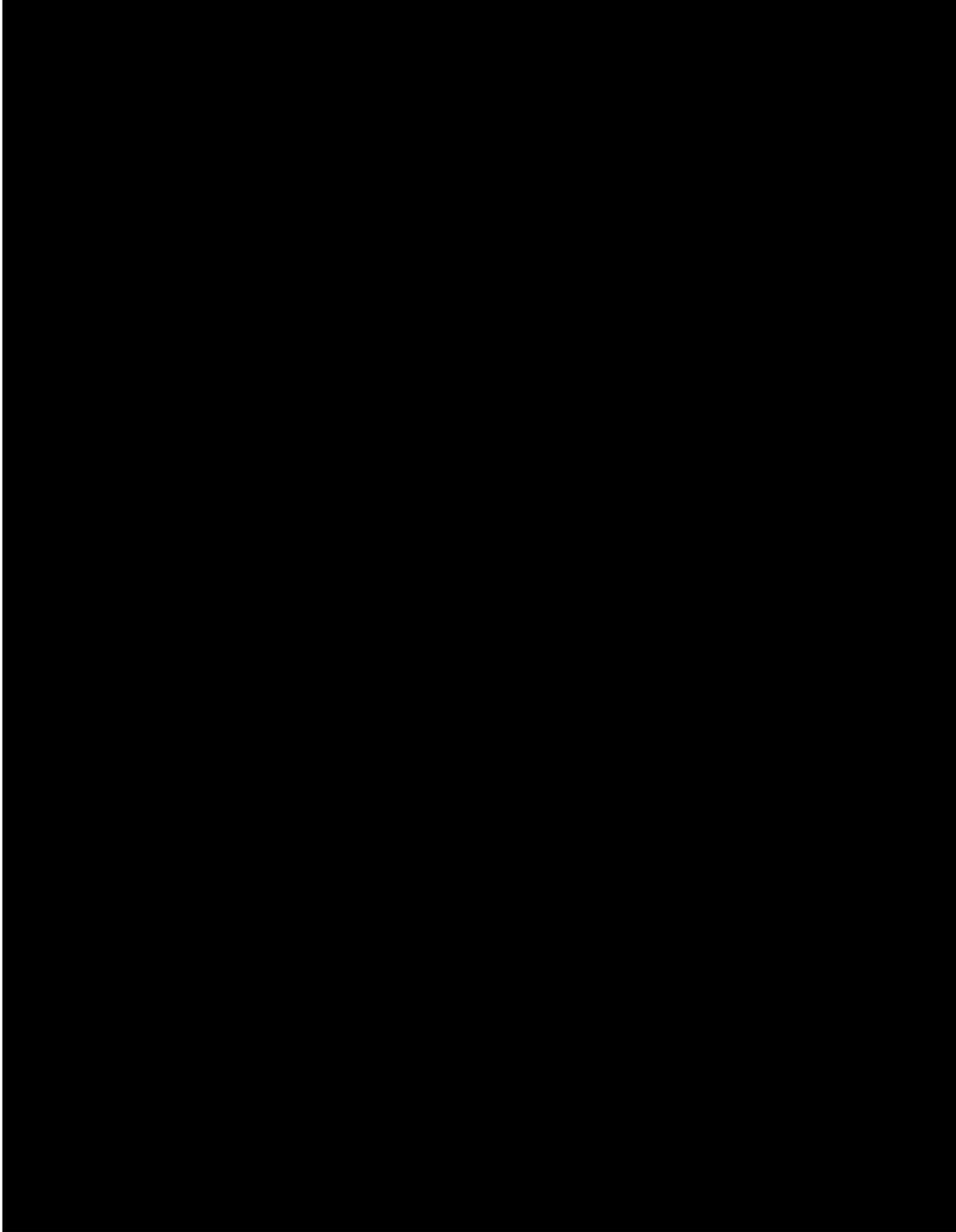
REDACTED Boston Gas Company and Colonial Gas Company
each d/b/a National Grid
D.P.U. 17-170
Attachment AG-21-39-41
Page 28 of 92



REDACTED

The Narragansett Electric Company
d/b/a National Grid
RIPUC Docket No. 4770
Attachment DIV 7-49-252
Page 29 of 92

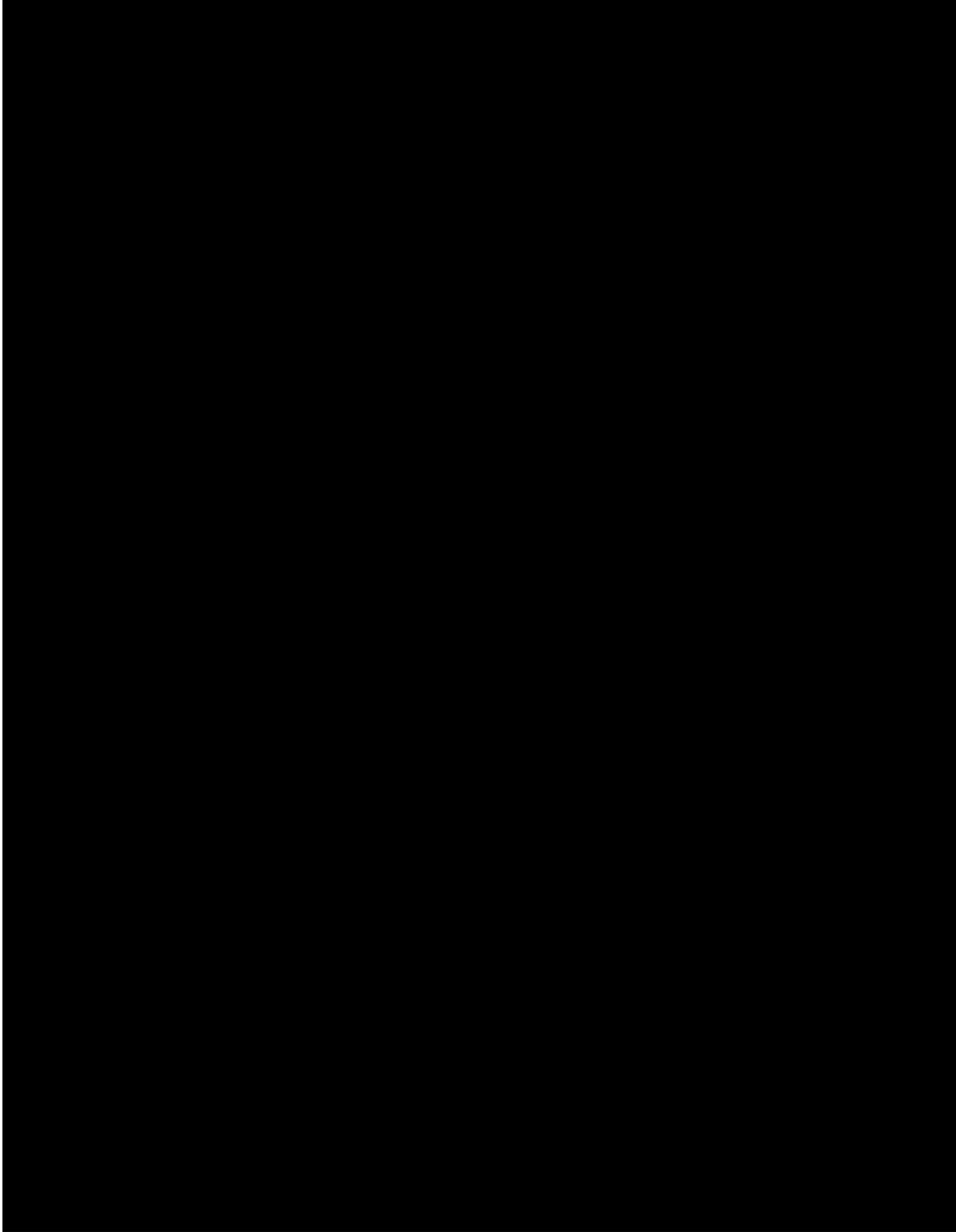
REDACTED Boston Gas Company and Colonial Gas Company
each d/b/a National Grid
D.P.U. 17-170
Attachment AG-21-39-41
Page 29 of 92



REDACTED

The Narragansett Electric Company
d/b/a National Grid
RIPUC Docket No. 4770
Attachment DIV 7-49-252
Page 30 of 92

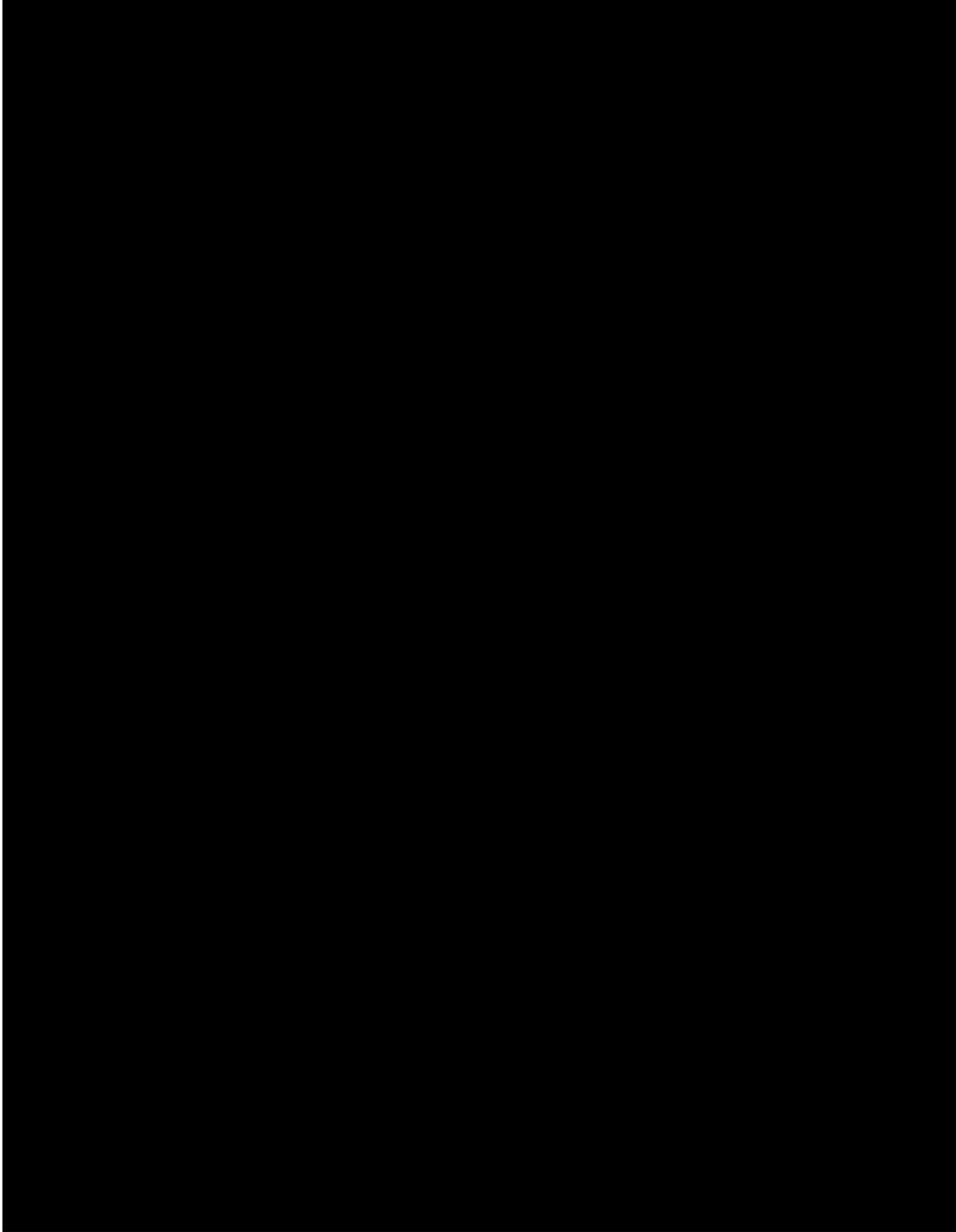
REDACTED Boston Gas Company and Colonial Gas Company
each d/b/a National Grid
D.P.U. 17-170
Attachment AG-21-39-41
Page 30 of 92



REDACTED

The Narragansett Electric Company
d/b/a National Grid
RIPUC Docket No. 4770
Attachment DIV 7-49-252
Page 31 of 92

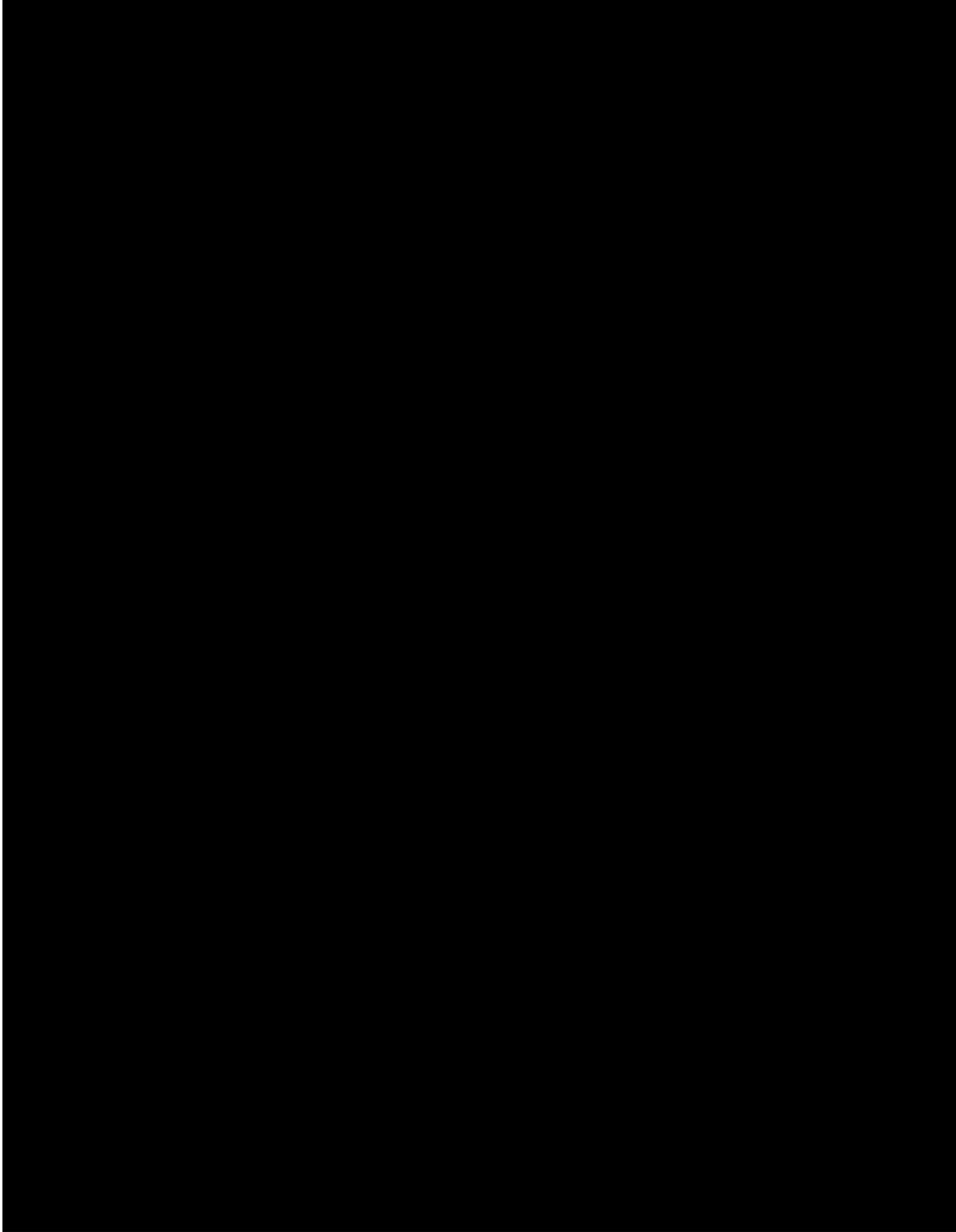
REDACTED Boston Gas Company and Colonial Gas Company
each d/b/a National Grid
D.P.U. 17-170
Attachment AG-21-39-41
Page 31 of 92



REDACTED

The Narragansett Electric Company
d/b/a National Grid
RIPUC Docket No. 4770
Attachment DIV 7-49-252
Page 32 of 92

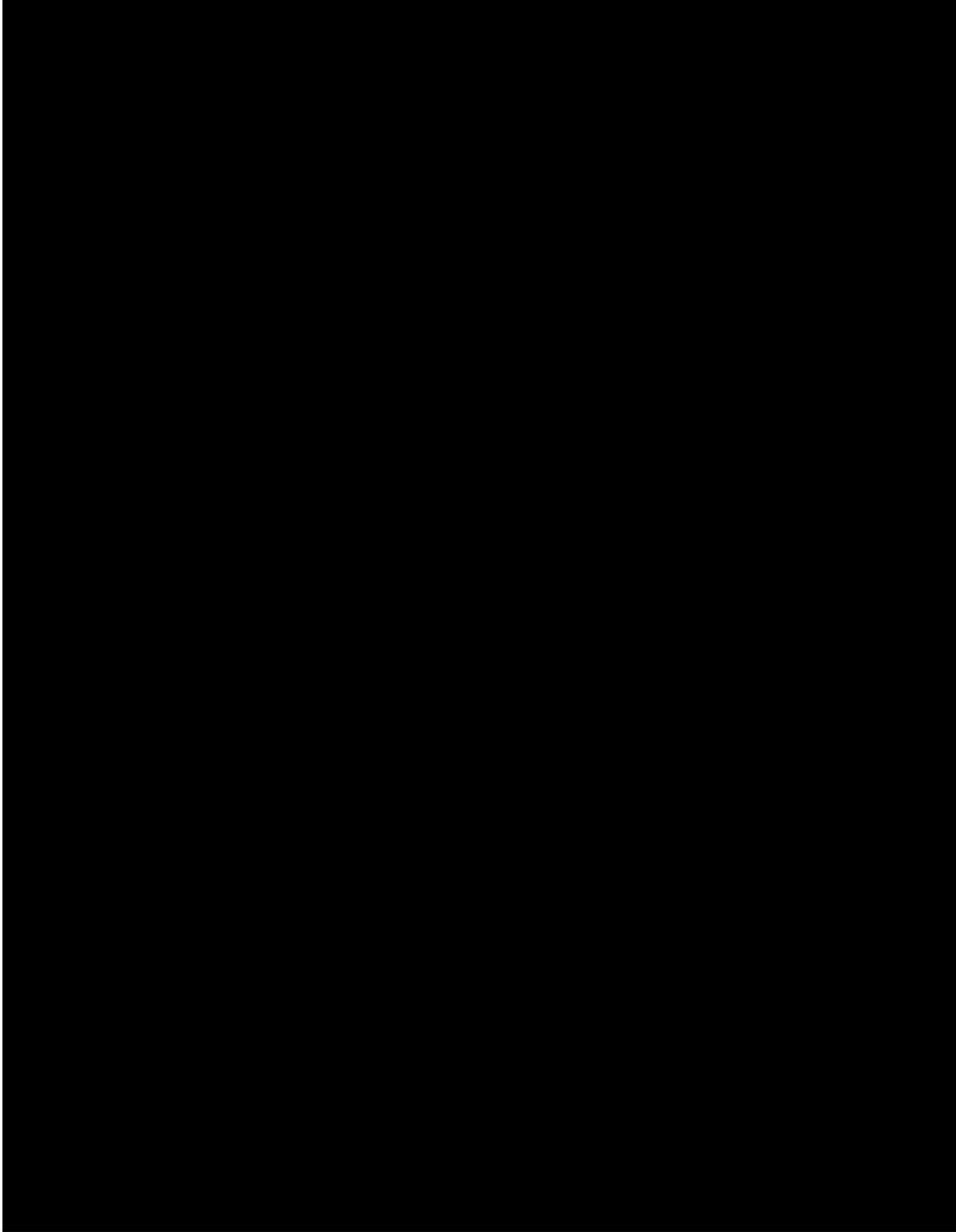
REDACTED Boston Gas Company and Colonial Gas Company
each d/b/a National Grid
D.P.U. 17-170
Attachment AG-21-39-41
Page 32 of 92



REDACTED

The Narragansett Electric Company
d/b/a National Grid
RIPUC Docket No. 4770
Attachment DIV 7-49-252
Page 33 of 92

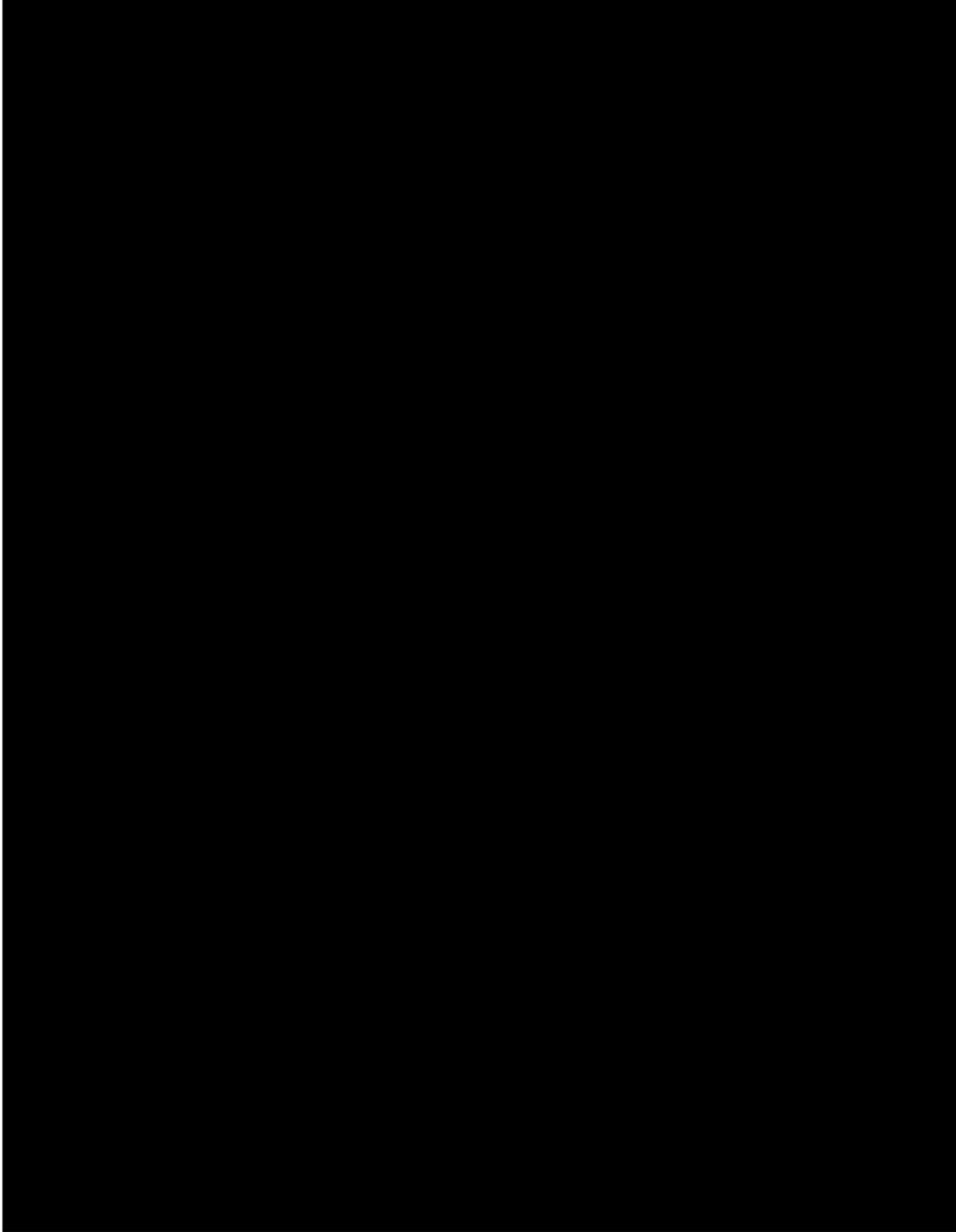
REDACTED Boston Gas Company and Colonial Gas Company
each d/b/a National Grid
D.P.U. 17-170
Attachment AG-21-39-41
Page 33 of 92



REDACTED

The Narragansett Electric Company
d/b/a National Grid
RIPUC Docket No. 4770
Attachment DIV 7-49-252
Page 34 of 92

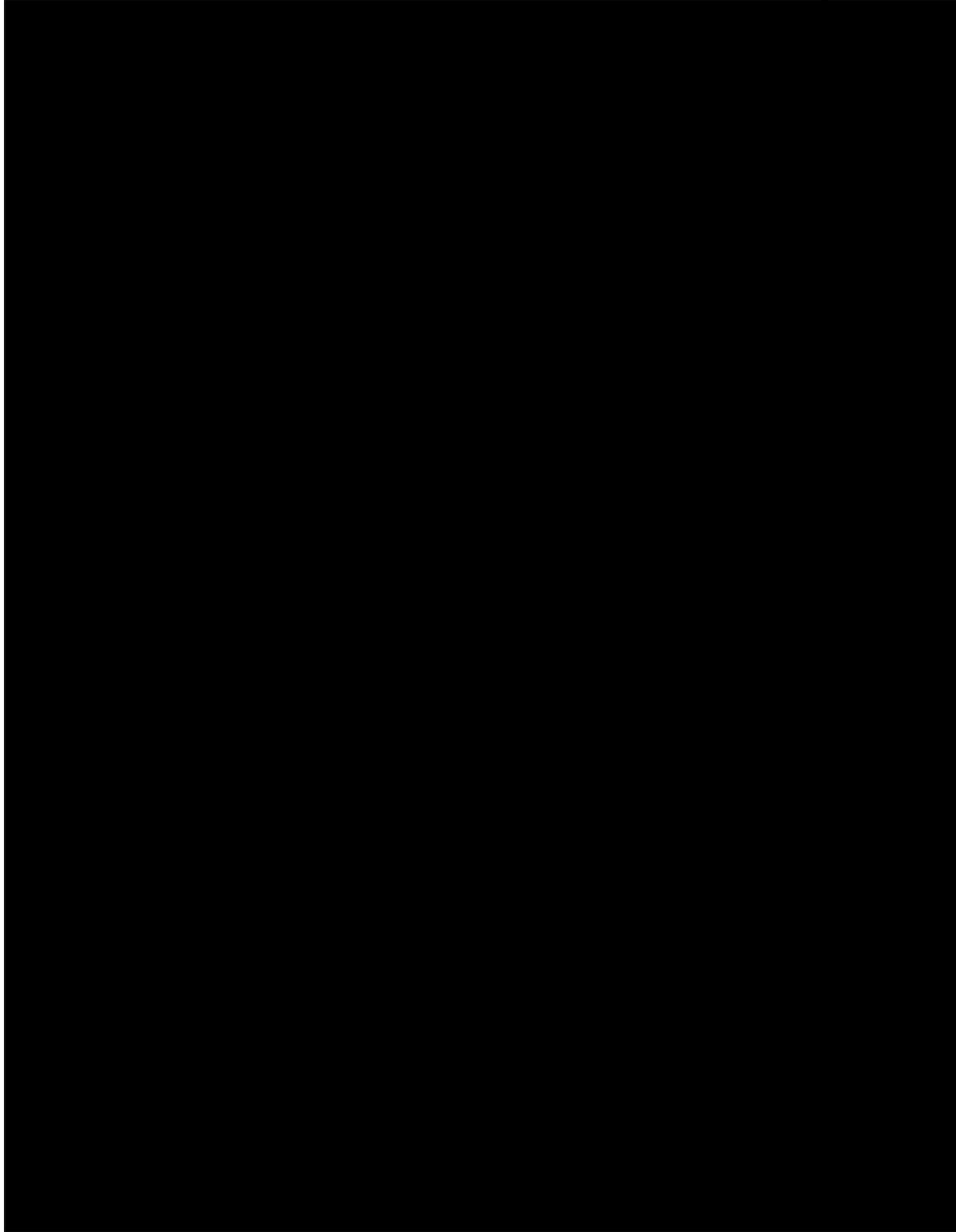
REDACTED Boston Gas Company and Colonial Gas Company
each d/b/a National Grid
D.P.U. 17-170
Attachment AG-21-39-41
Page 34 of 92



REDACTED

The Narragansett Electric Company
d/b/a National Grid
RIPUC Docket No. 4770
Attachment DIV 7-49-252
Page 35 of 92

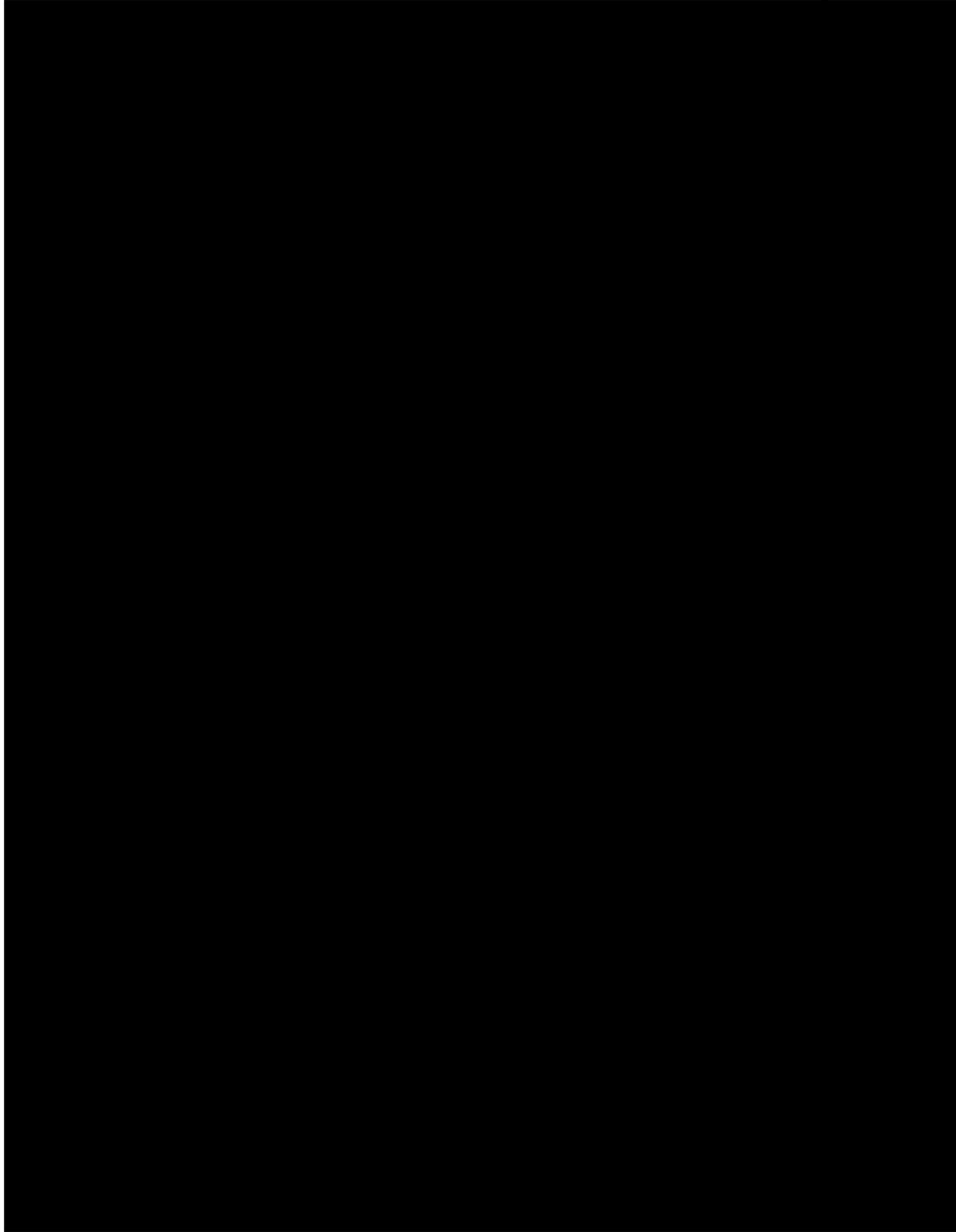
REDACTED Boston Gas Company and Colonial Gas Company
each d/b/a National Grid
D.P.U. 17-170
Attachment AG-21-39-41
Page 35 of 92



REDACTED

The Narragansett Electric Company
d/b/a National Grid
RIPUC Docket No. 4770
Attachment DIV 7-49-252
Page 36 of 92

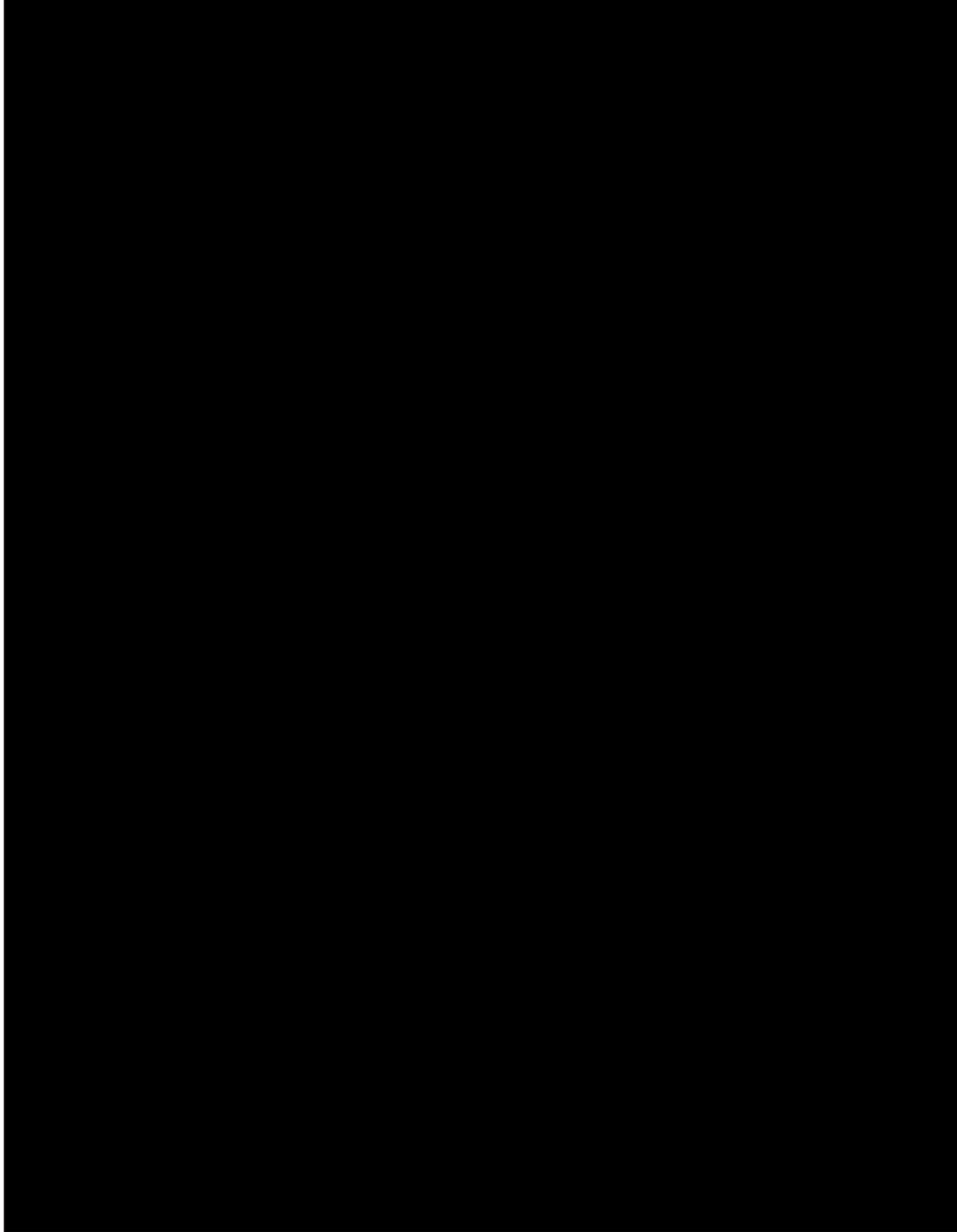
REDACTED Boston Gas Company and Colonial Gas Company
each d/b/a National Grid
D.P.U. 17-170
Attachment AG-21-39-41
Page 36 of 92



REDACTED

The Narragansett Electric Company
d/b/a National Grid
RIPUC Docket No. 4770
Attachment DIV 7-49-252
Page 37 of 92

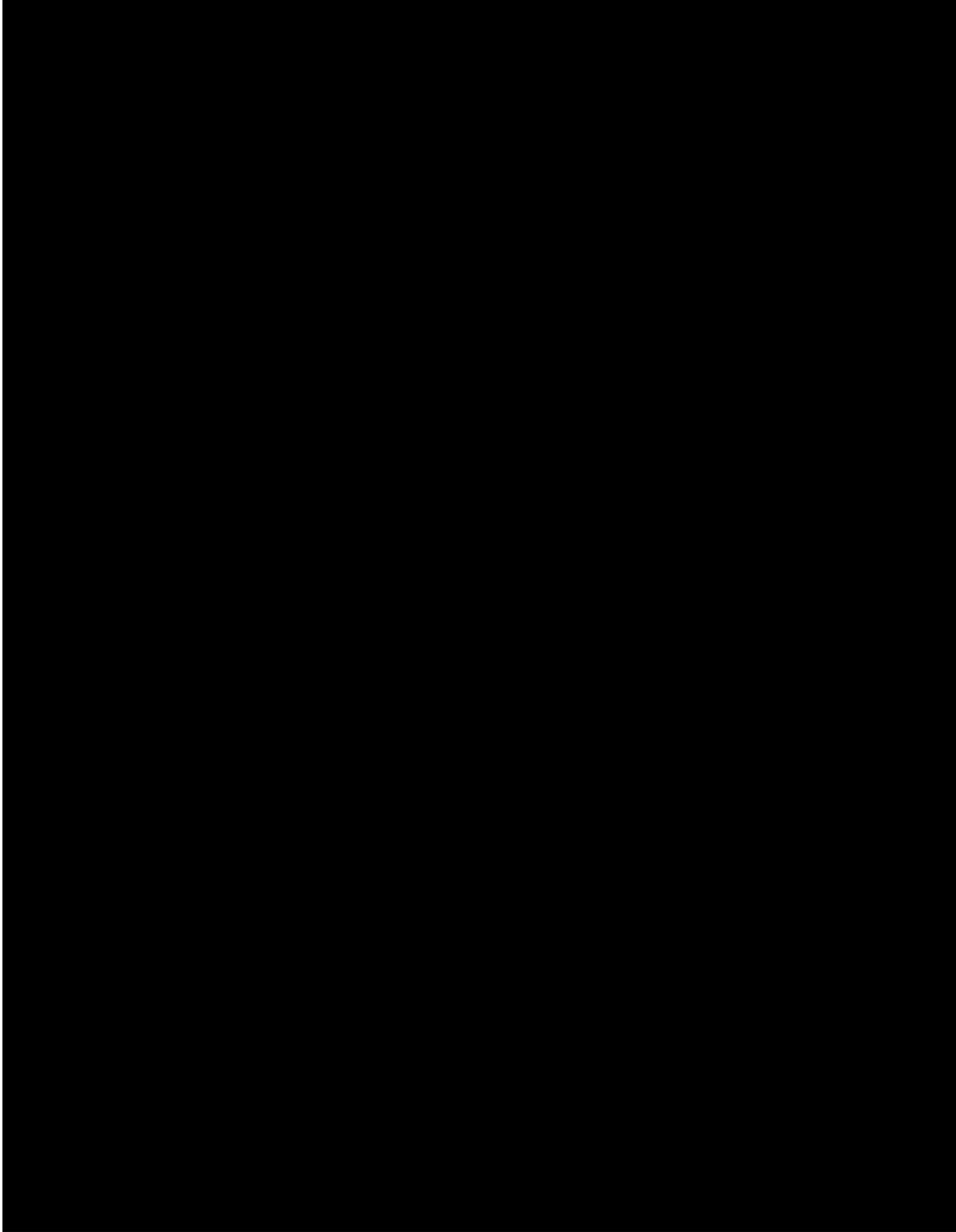
REDACTED Boston Gas Company and Colonial Gas Company
each d/b/a National Grid
D.P.U. 17-170
Attachment AG-21-39-41
Page 37 of 92



REDACTED

The Narragansett Electric Company
d/b/a National Grid
RIPUC Docket No. 4770
Attachment DIV 7-49-252
Page 38 of 92

REDACTED Boston Gas Company and Colonial Gas Company
each d/b/a National Grid
D.P.U. 17-170
Attachment AG-21-39-41
Page 38 of 92

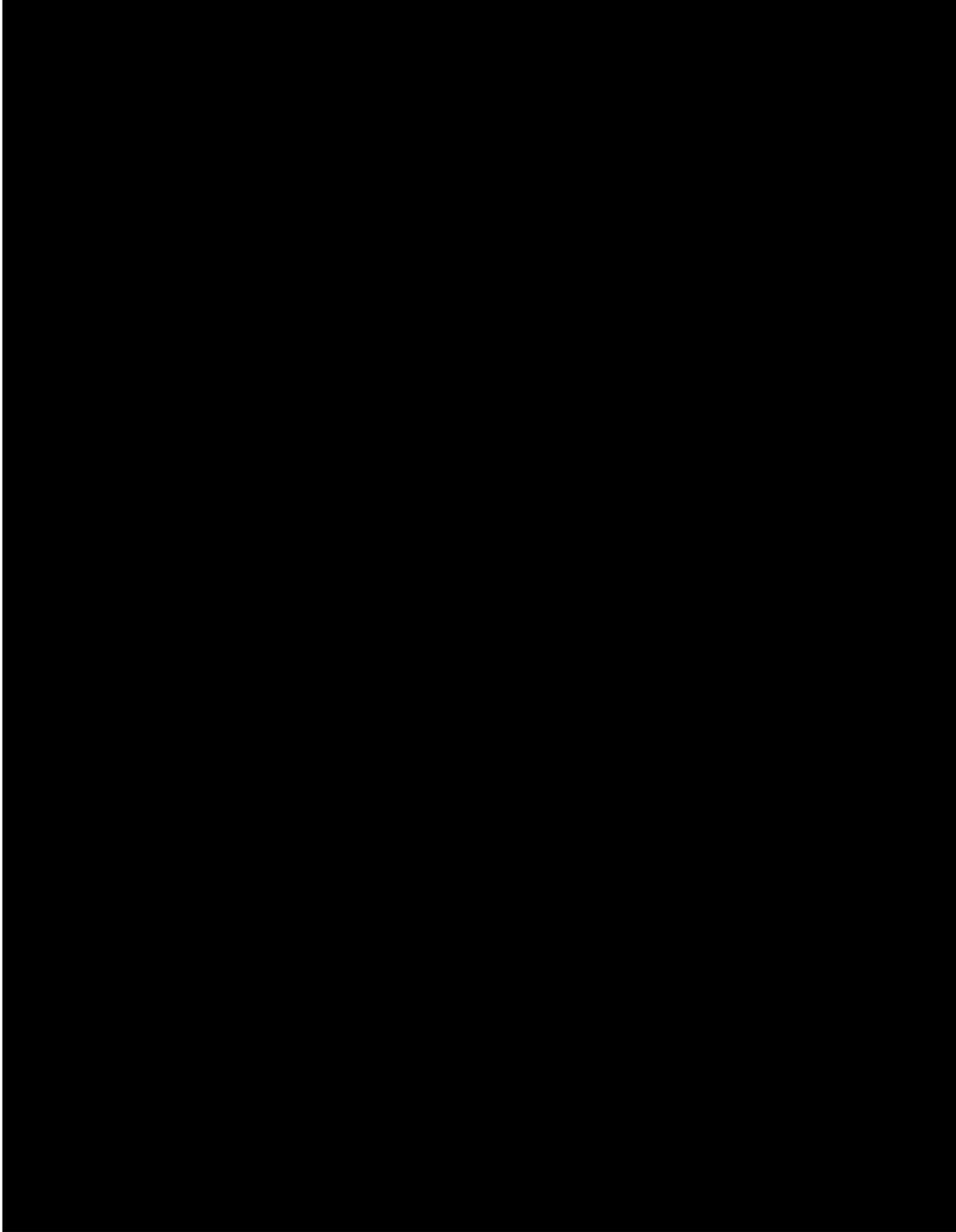


REDACTED

The Narragansett Electric Company
d/b/a National Grid
RIPUC Docket No. 4770
Attachment DIV 7-49-252
Page 39 of 92

REDACTED

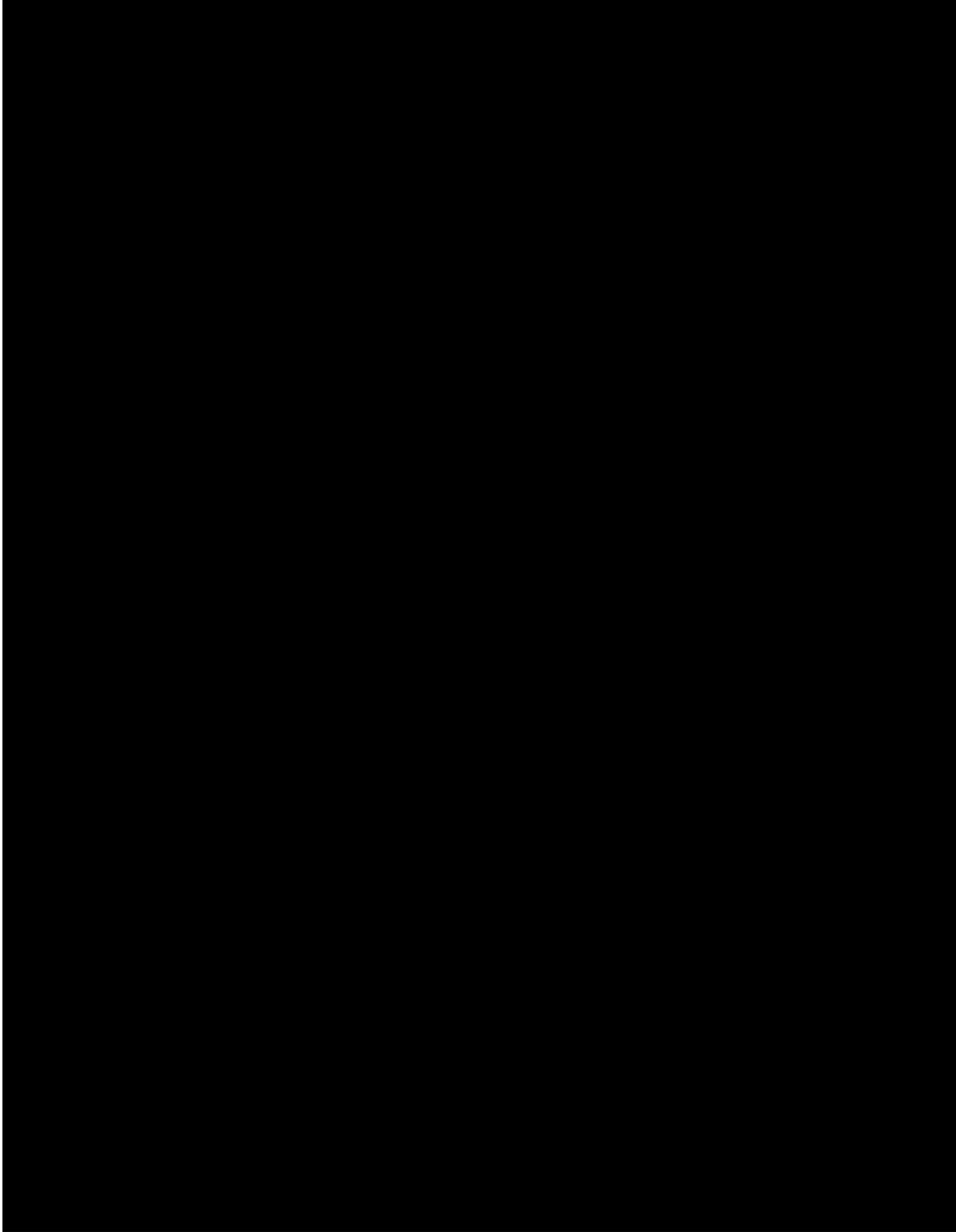
Boston Gas Company and Colonial Gas Company
each d/b/a National Grid
D.P.U. 17-170
Attachment AG-21-39-41
Page 39 of 92



REDACTED

The Narragansett Electric Company
d/b/a National Grid
RIPUC Docket No. 4770
Attachment DIV 7-49-252
Page 40 of 92

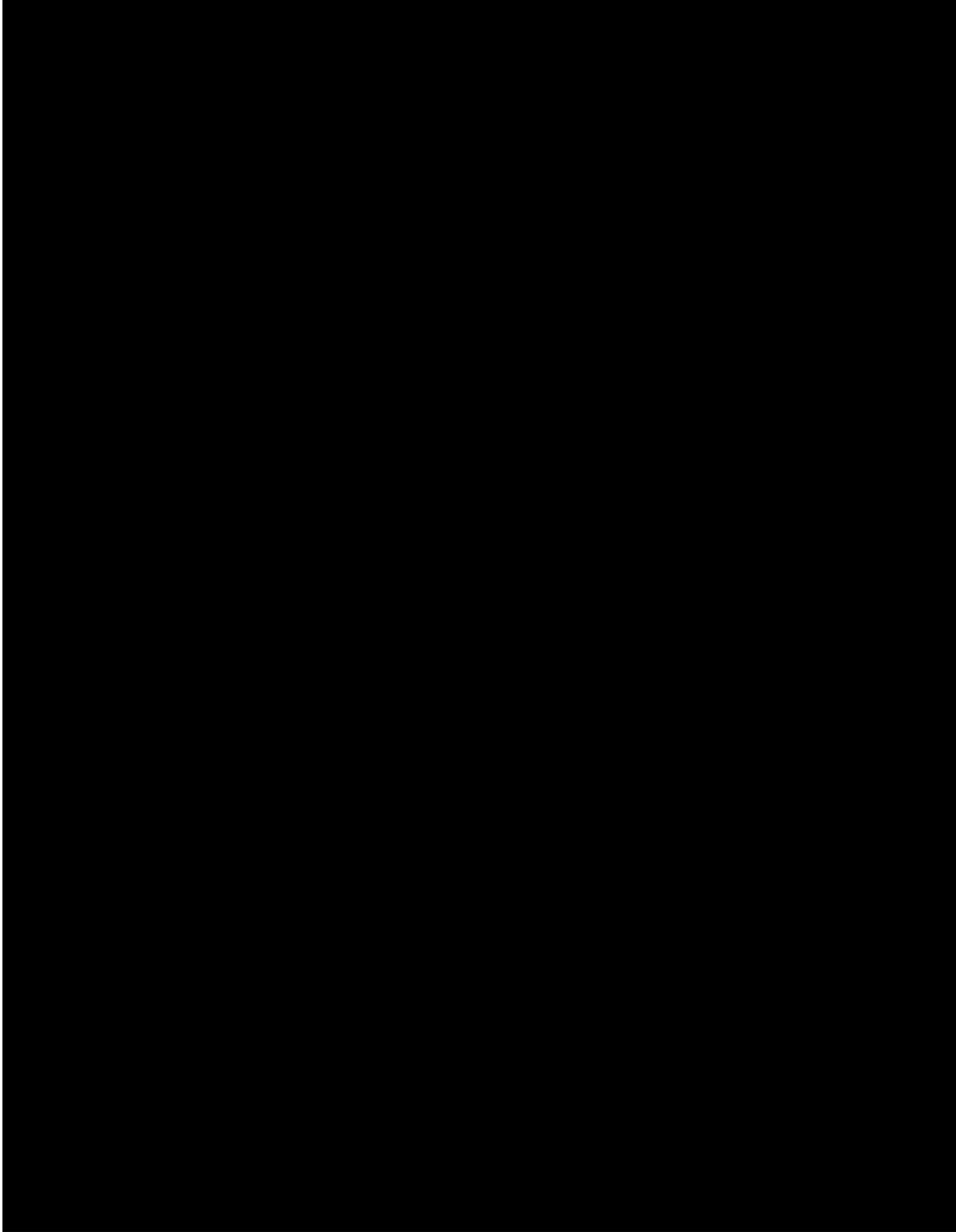
REDACTED Boston Gas Company and Colonial Gas Company
each d/b/a National Grid
D.P.U. 17-170
Attachment AG-21-39-41
Page 40 of 92



REDACTED

The Narragansett Electric Company
d/b/a National Grid
RIPUC Docket No. 4770
Attachment DIV 7-49-252
Page 41 of 92

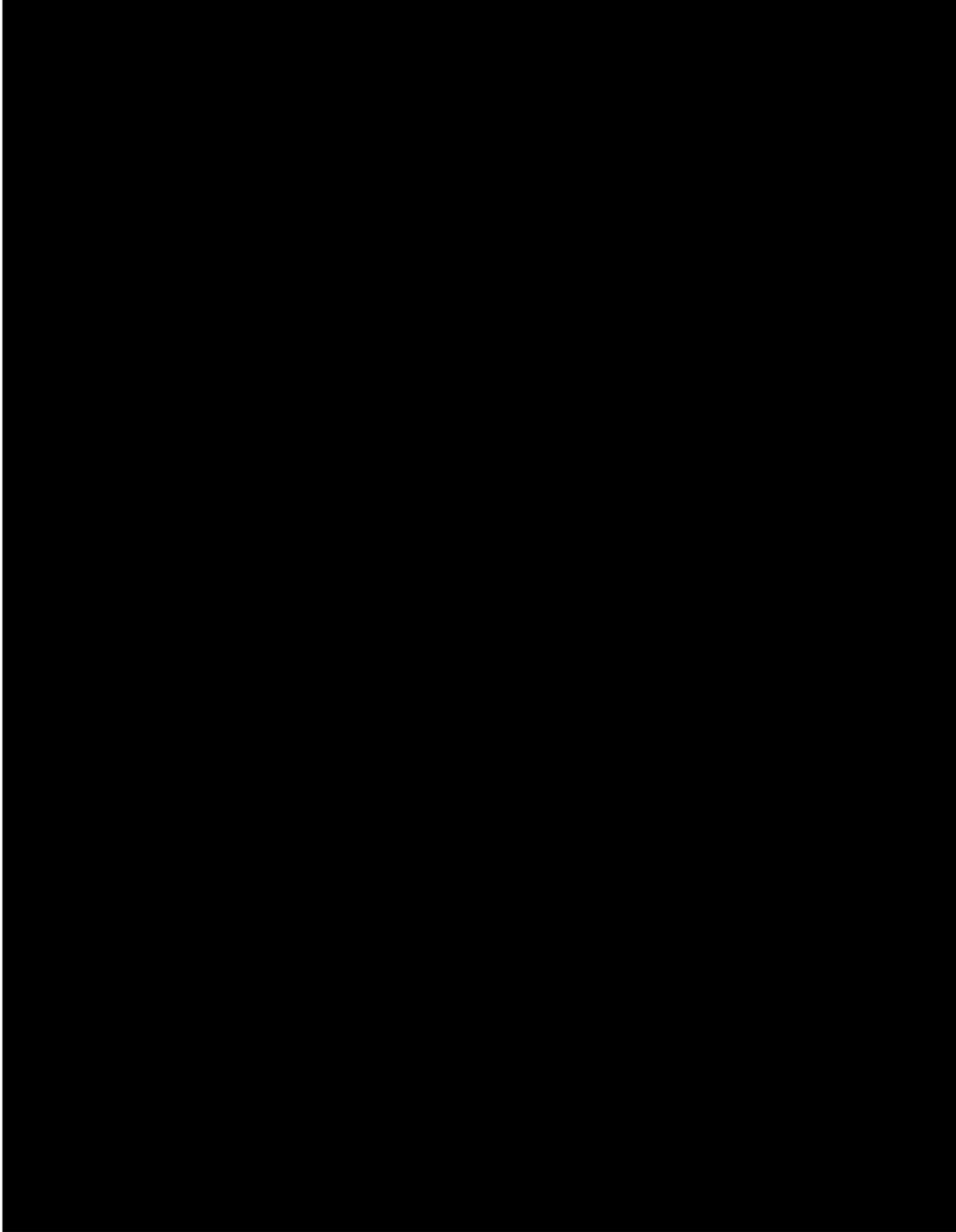
REDACTED Boston Gas Company and Colonial Gas Company
each d/b/a National Grid
D.P.U. 17-170
Attachment AG-21-39-41
Page 41 of 92



REDACTED

The Narragansett Electric Company
d/b/a National Grid
RIPUC Docket No. 4770
Attachment DIV 7-49-252
Page 42 of 92

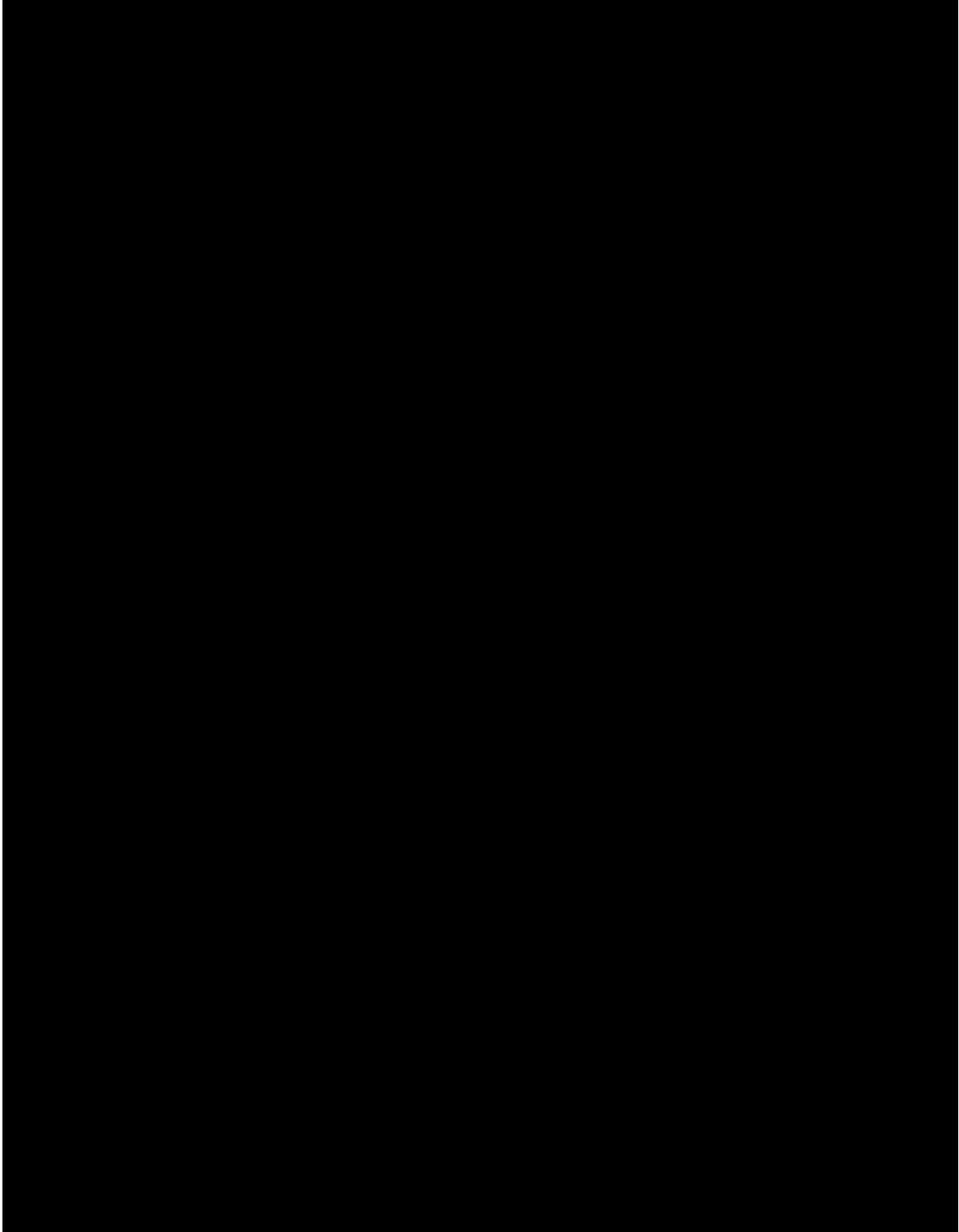
REDACTED Boston Gas Company and Colonial Gas Company
each d/b/a National Grid
D.P.U. 17-170
Attachment AG-21-39-41
Page 42 of 92



REDACTED

The Narragansett Electric Company
d/b/a National Grid
RIPUC Docket No. 4770
Attachment DIV 7-49-252
Page 43 of 92

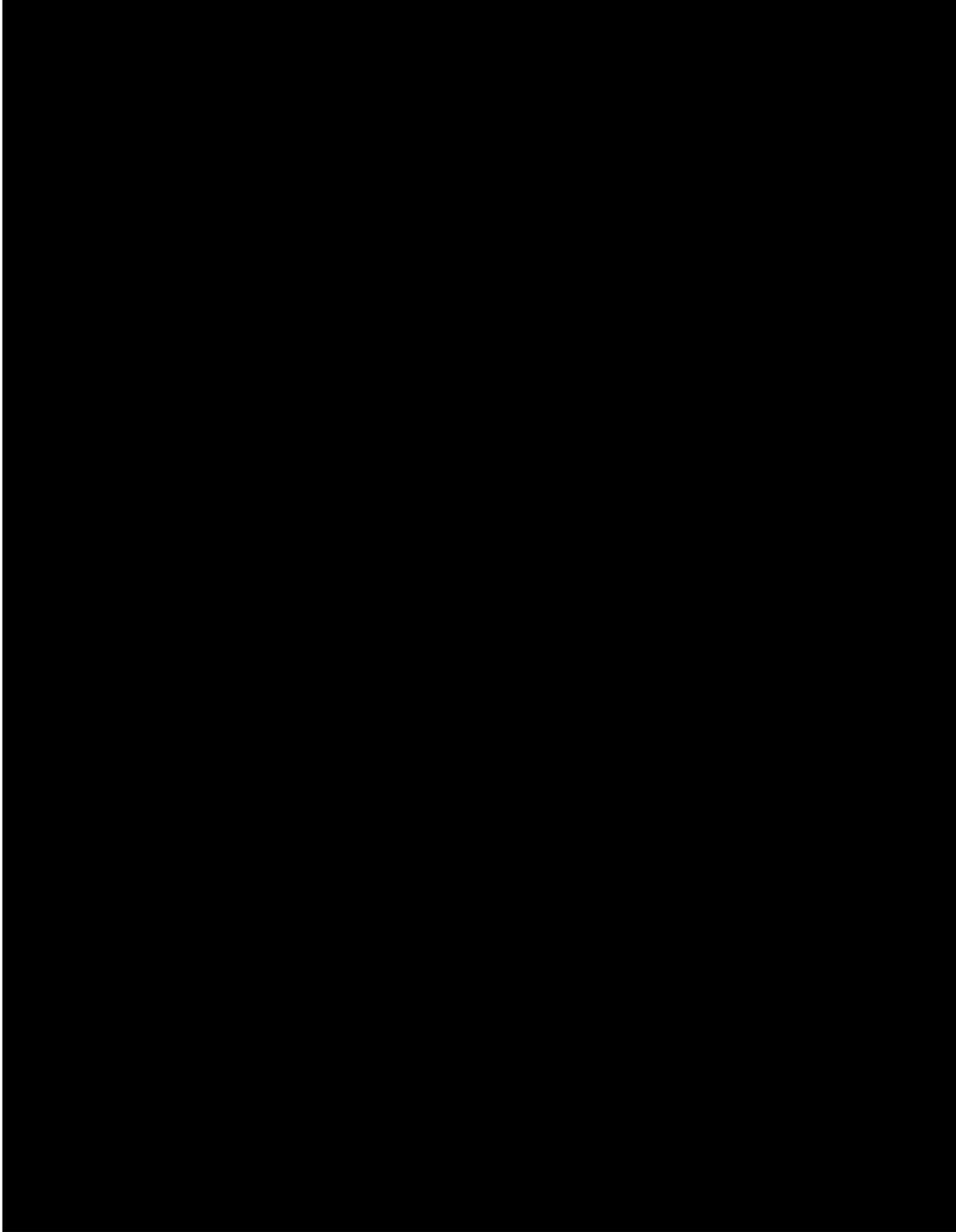
REDACTED Boston Gas Company and Colonial Gas Company
each d/b/a National Grid
D.P.U. 17-170
Attachment AG-21-39-41
Page 43 of 92



REDACTED

The Narragansett Electric Company
d/b/a National Grid
RIPUC Docket No. 4770
Attachment DIV 7-49-252
Page 44 of 92

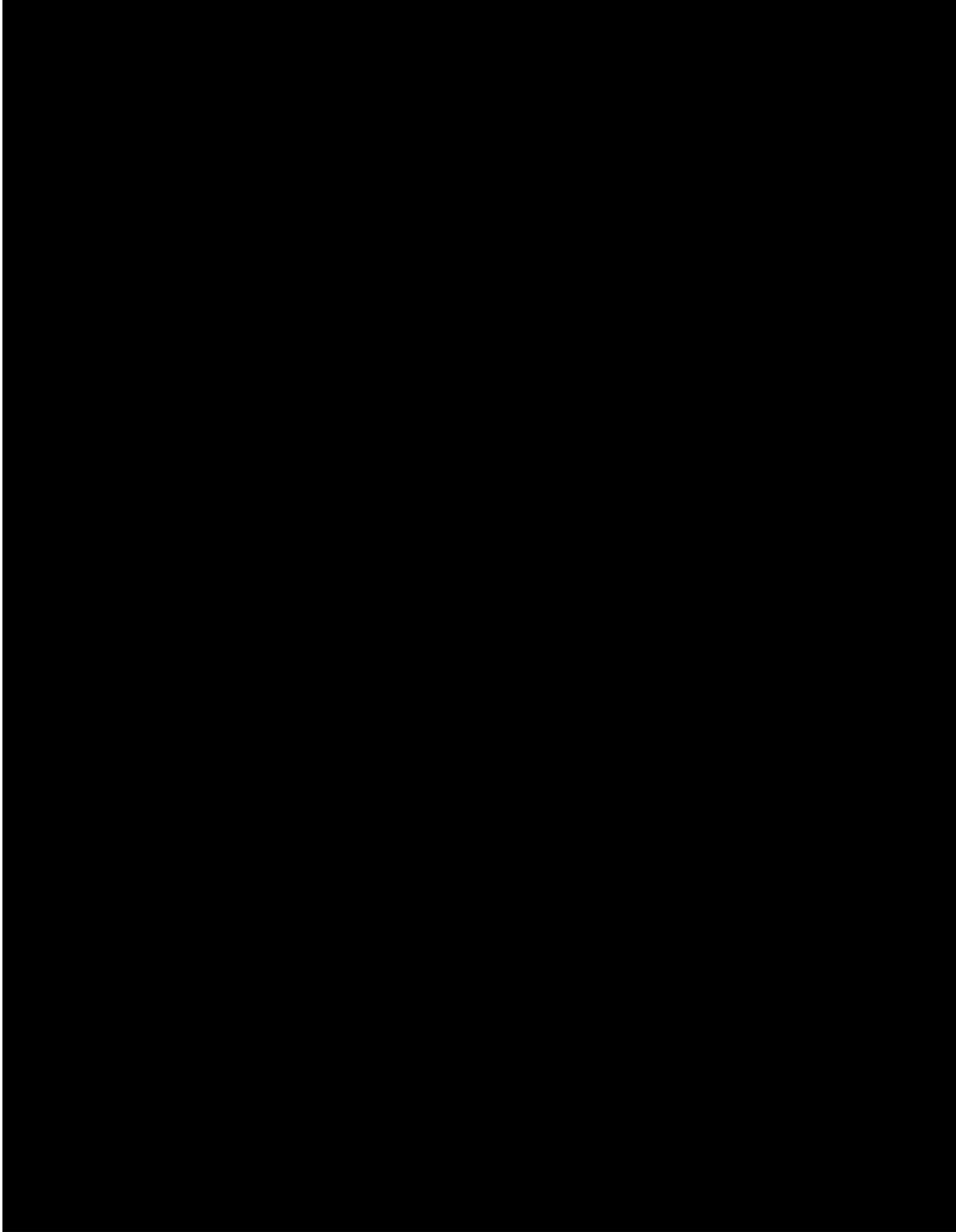
REDACTED Boston Gas Company and Colonial Gas Company
each d/b/a National Grid
D.P.U. 17-170
Attachment AG-21-39-41
Page 44 of 92



REDACTED

The Narragansett Electric Company
d/b/a National Grid
RIPUC Docket No. 4770
Attachment DIV 7-49-252
Page 45 of 92

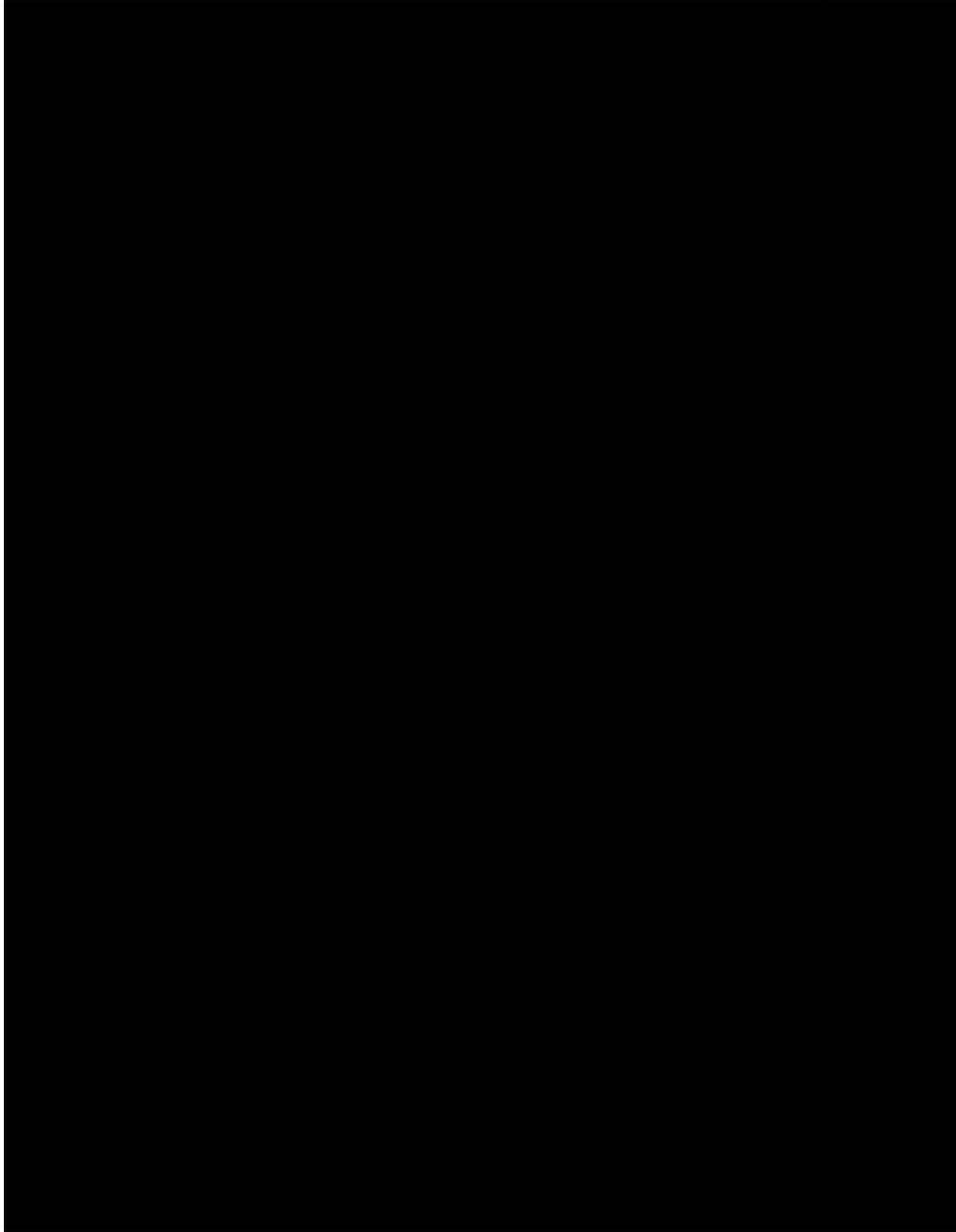
REDACTED Boston Gas Company and Colonial Gas Company
each d/b/a National Grid
D.P.U. 17-170
Attachment AG-21-39-41
Page 45 of 92



REDACTED

The Narragansett Electric Company
d/b/a National Grid
RIPUC Docket No. 4770
Attachment DIV 7-49-252
Page 46 of 92

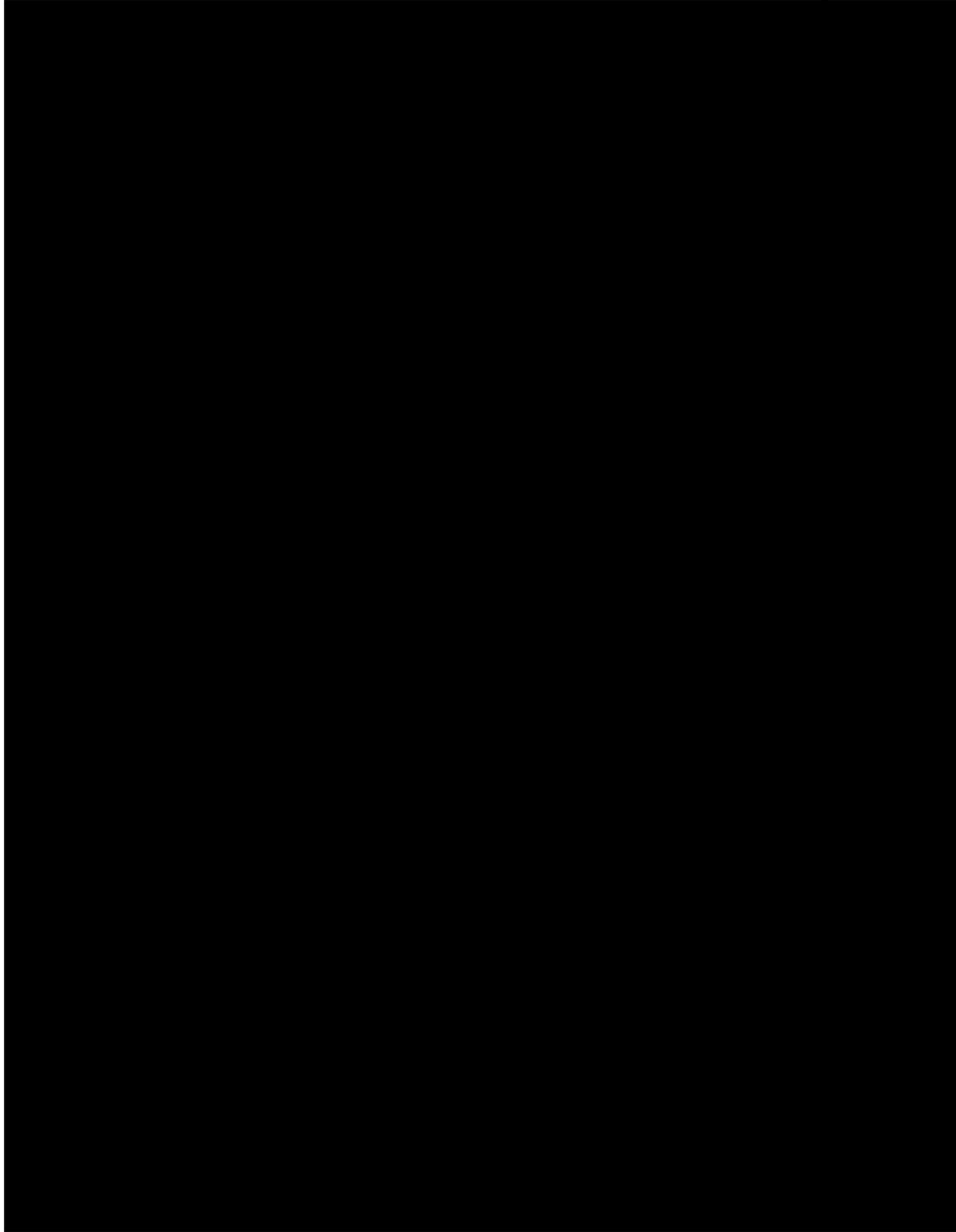
REDACTED Boston Gas Company and Colonial Gas Company
each d/b/a National Grid
D.P.U. 17-170
Attachment AG-21-39-41
Page 46 of 92



REDACTED

The Narragansett Electric Company
d/b/a National Grid
RIPUC Docket No. 4770
Attachment DIV 7-49-252
Page 47 of 92

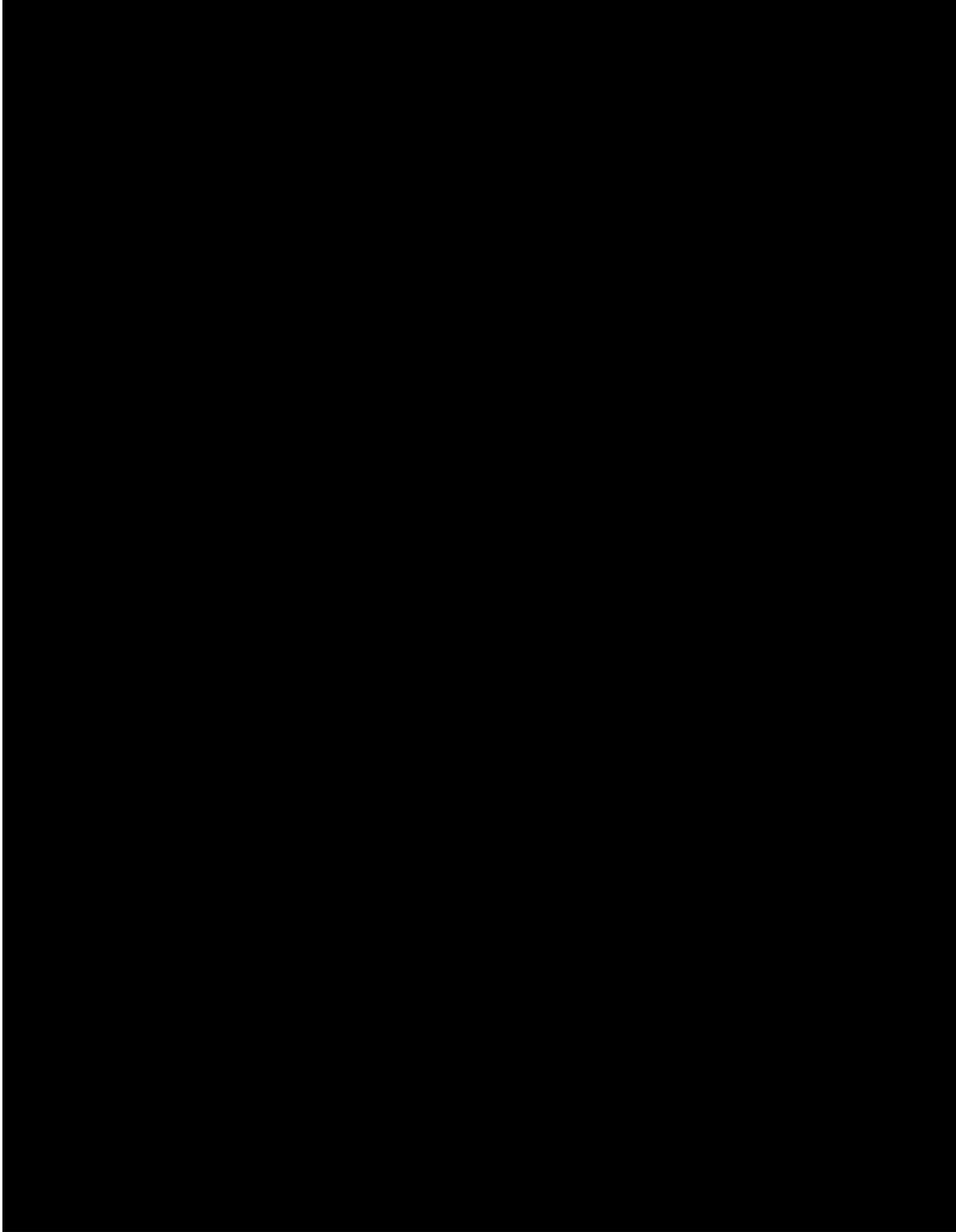
REDACTED Boston Gas Company and Colonial Gas Company
each d/b/a National Grid
D.P.U. 17-170
Attachment AG-21-39-41
Page 47 of 92



REDACTED

The Narragansett Electric Company
d/b/a National Grid
RIPUC Docket No. 4770
Attachment DIV 7-49-252
Page 48 of 92

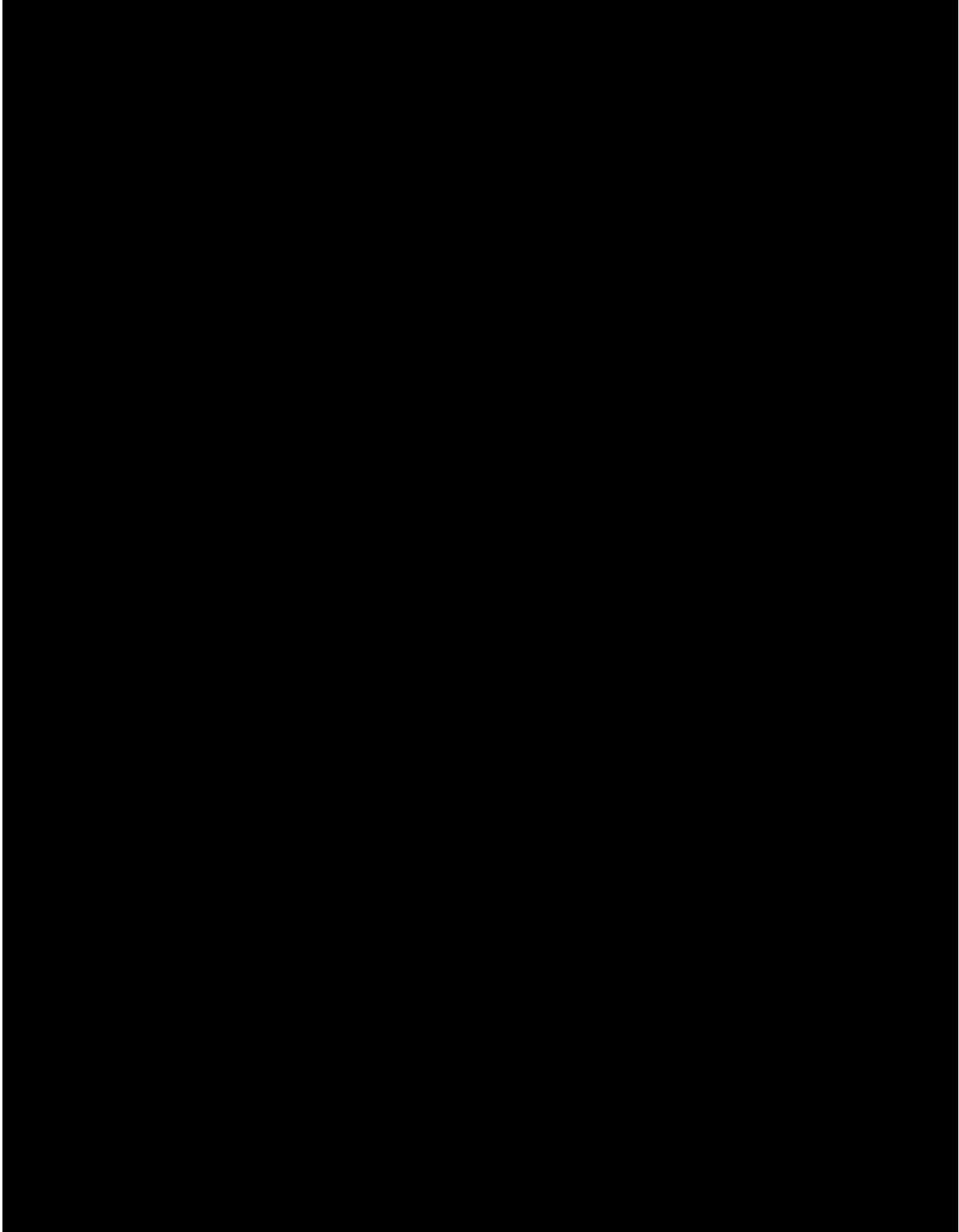
REDACTED Boston Gas Company and Colonial Gas Company
each d/b/a National Grid
D.P.U. 17-170
Attachment AG-21-39-41
Page 48 of 92



REDACTED

The Narragansett Electric Company
d/b/a National Grid
RIPUC Docket No. 4770
Attachment DIV 7-49-252
Page 49 of 92

REDACTED Boston Gas Company and Colonial Gas Company
each d/b/a National Grid
D.P.U. 17-170
Attachment AG-21-39-41
Page 49 of 92

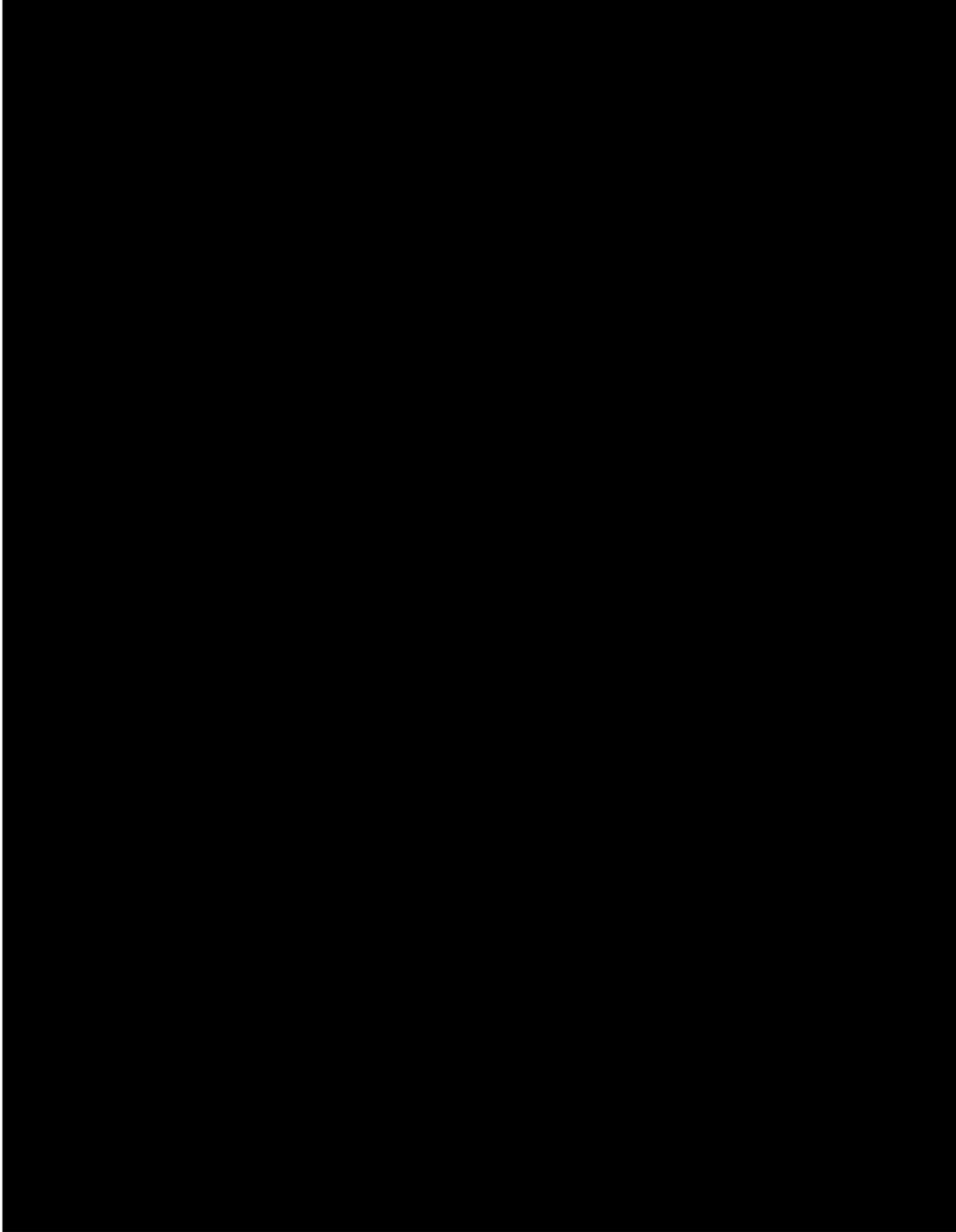


REDACTED

The Narragansett Electric Company
d/b/a National Grid
RIPUC Docket No. 4770
Attachment DIV 7-49-252
Page 50 of 92

REDACTED

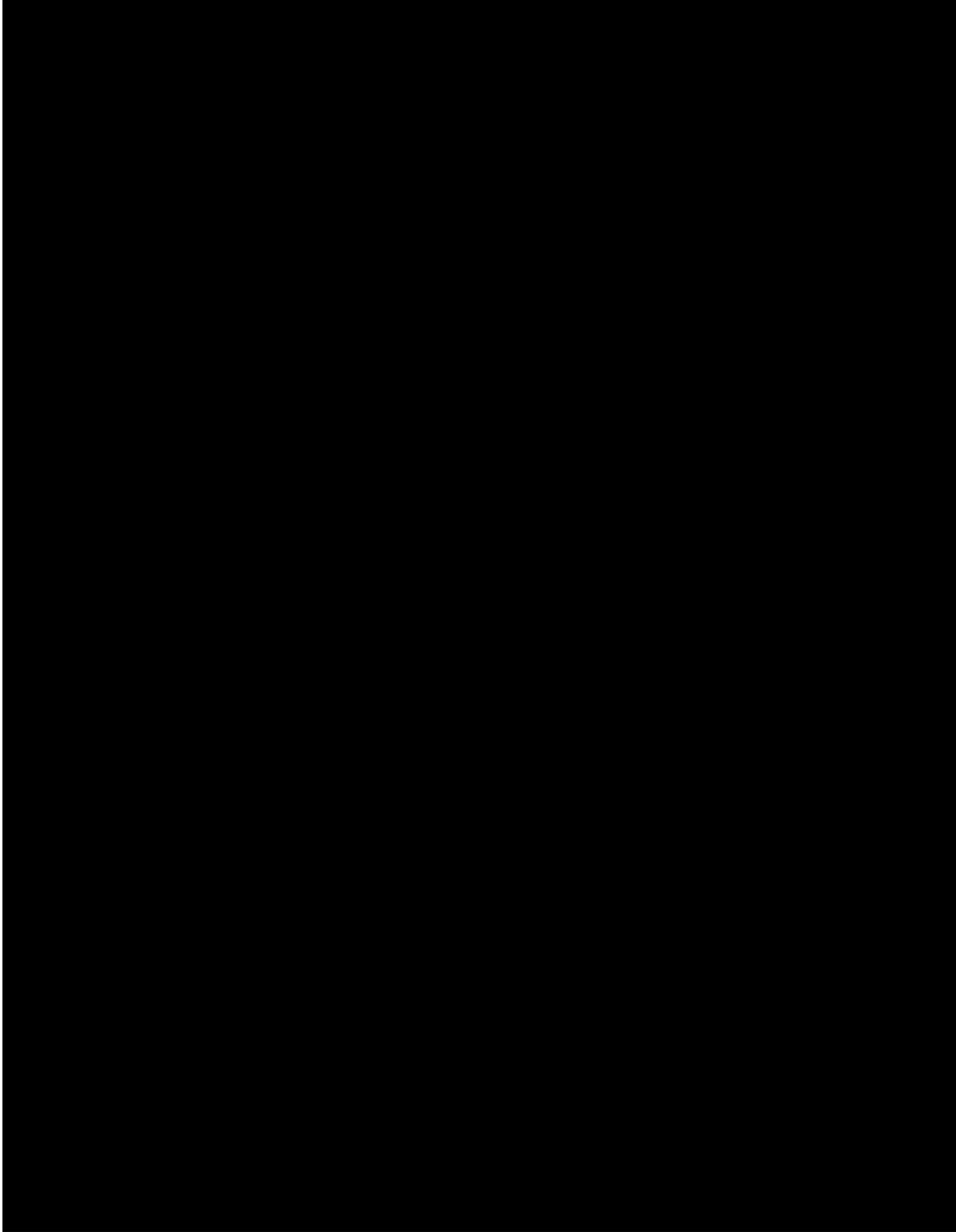
Boston Gas Company and Colonial Gas Company
each d/b/a National Grid
D.P.U. 17-170
Attachment AG-21-39-41
Page 50 of 92



REDACTED

The Narragansett Electric Company
d/b/a National Grid
RIPUC Docket No. 4770
Attachment DIV 7-49-252
Page 51 of 92

REDACTED Boston Gas Company and Colonial Gas Company
each d/b/a National Grid
D.P.U. 17-170
Attachment AG-21-39-41
Page 51 of 92

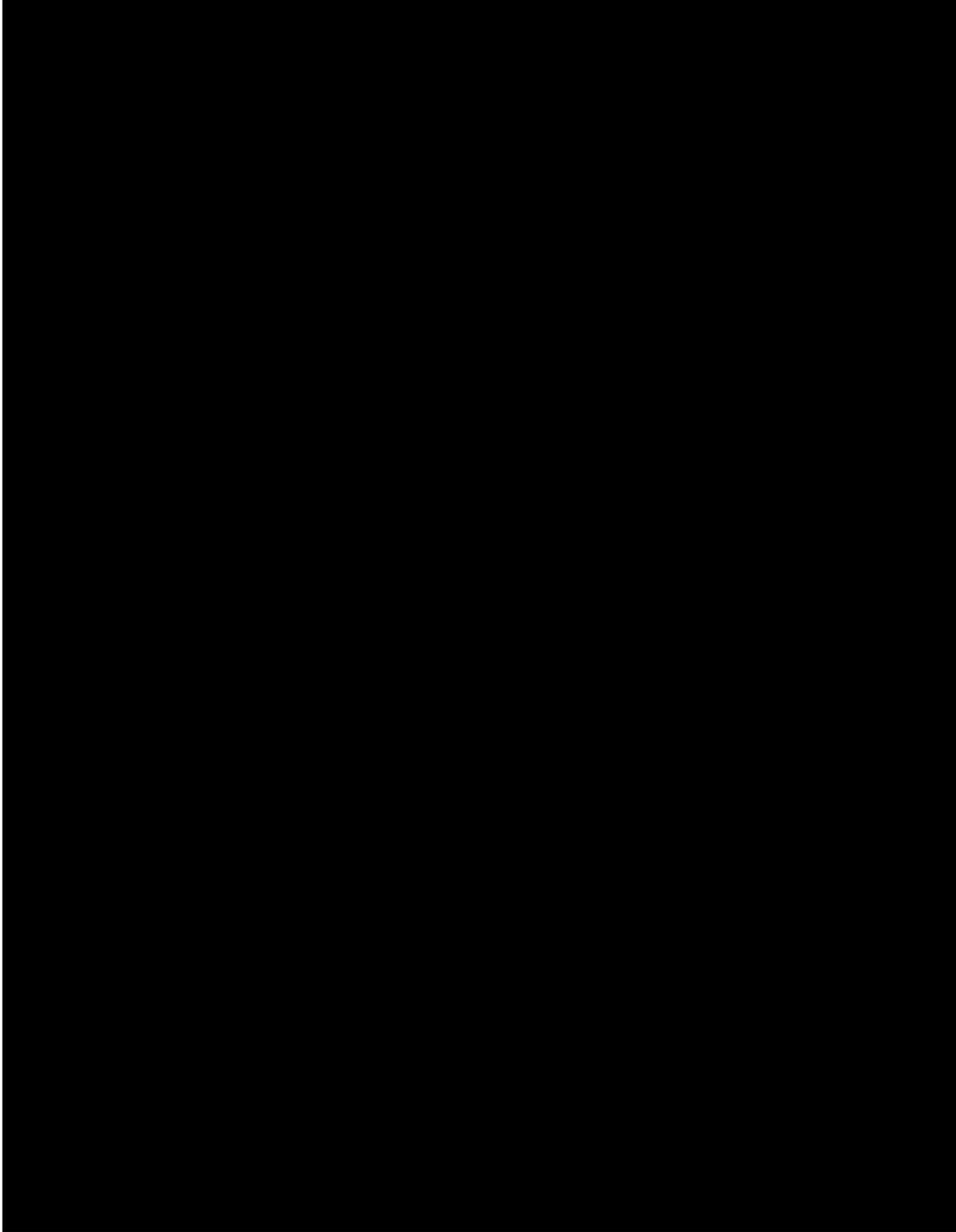


REDACTED

The Narragansett Electric Company
d/b/a National Grid
RIPUC Docket No. 4770
Attachment DIV 7-49-252
Page 52 of 92

REDACTED

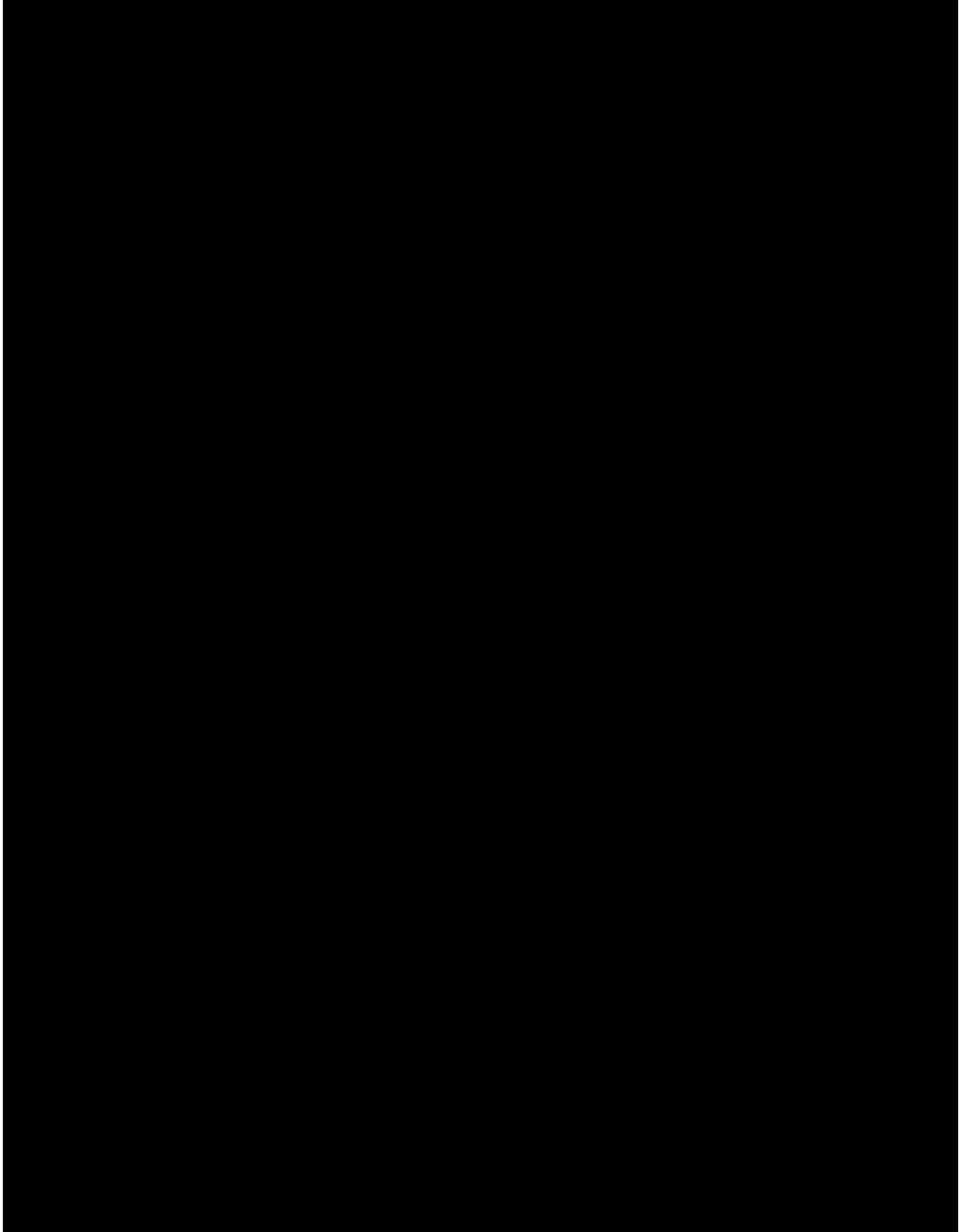
Boston Gas Company and Colonial Gas Company
each d/b/a National Grid
D.P.U. 17-170
Attachment AG-21-39-41
Page 52 of 92



REDACTED

The Narragansett Electric Company
d/b/a National Grid
RIPUC Docket No. 4770
Attachment DIV 7-49-252
Page 53 of 92

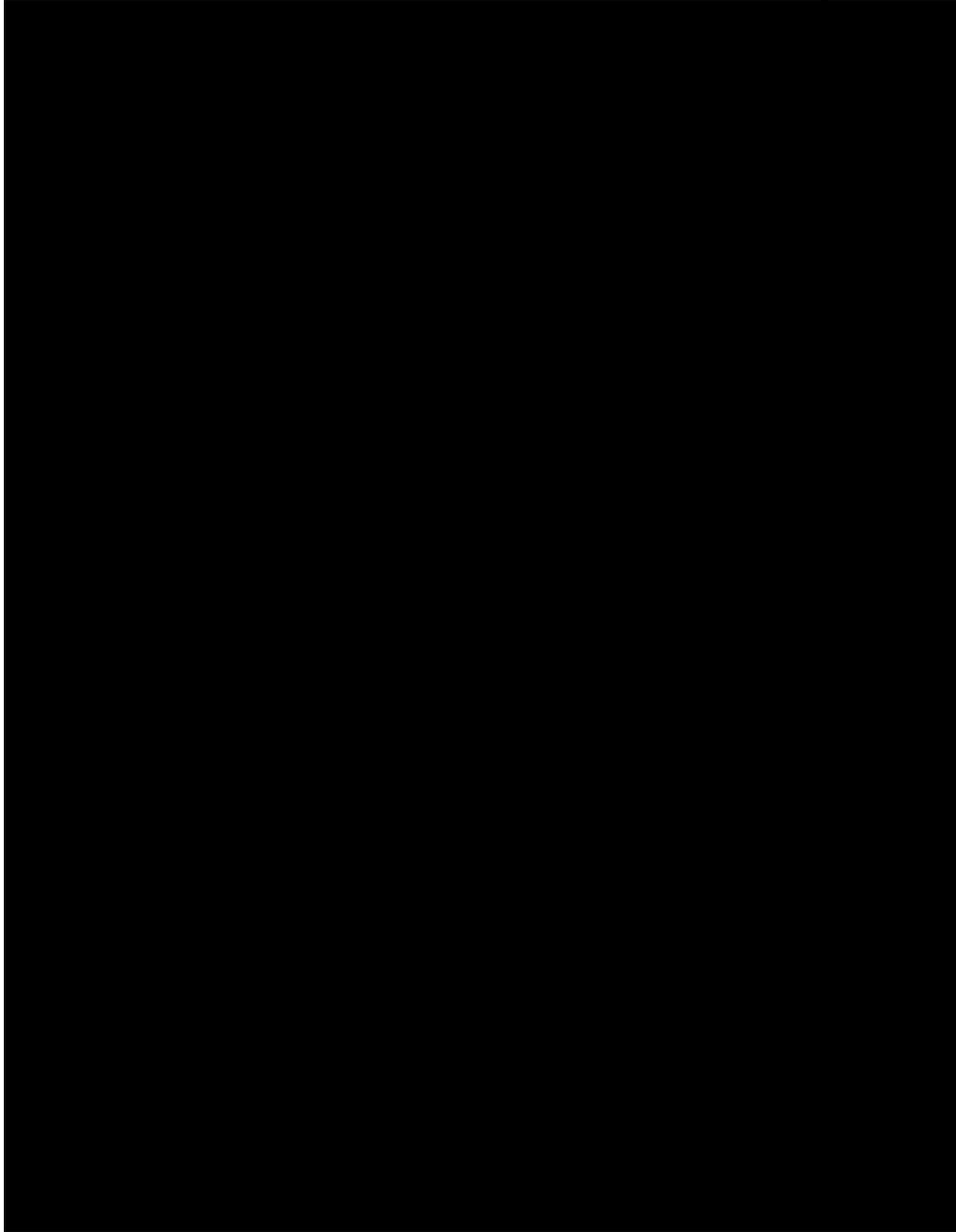
REDACTED Boston Gas Company and Colonial Gas Company
each d/b/a National Grid
D.P.U. 17-170
Attachment AG-21-39-41
Page 53 of 92



REDACTED

The Narragansett Electric Company
d/b/a National Grid
RIPUC Docket No. 4770
Attachment DIV 7-49-252
Page 54 of 92

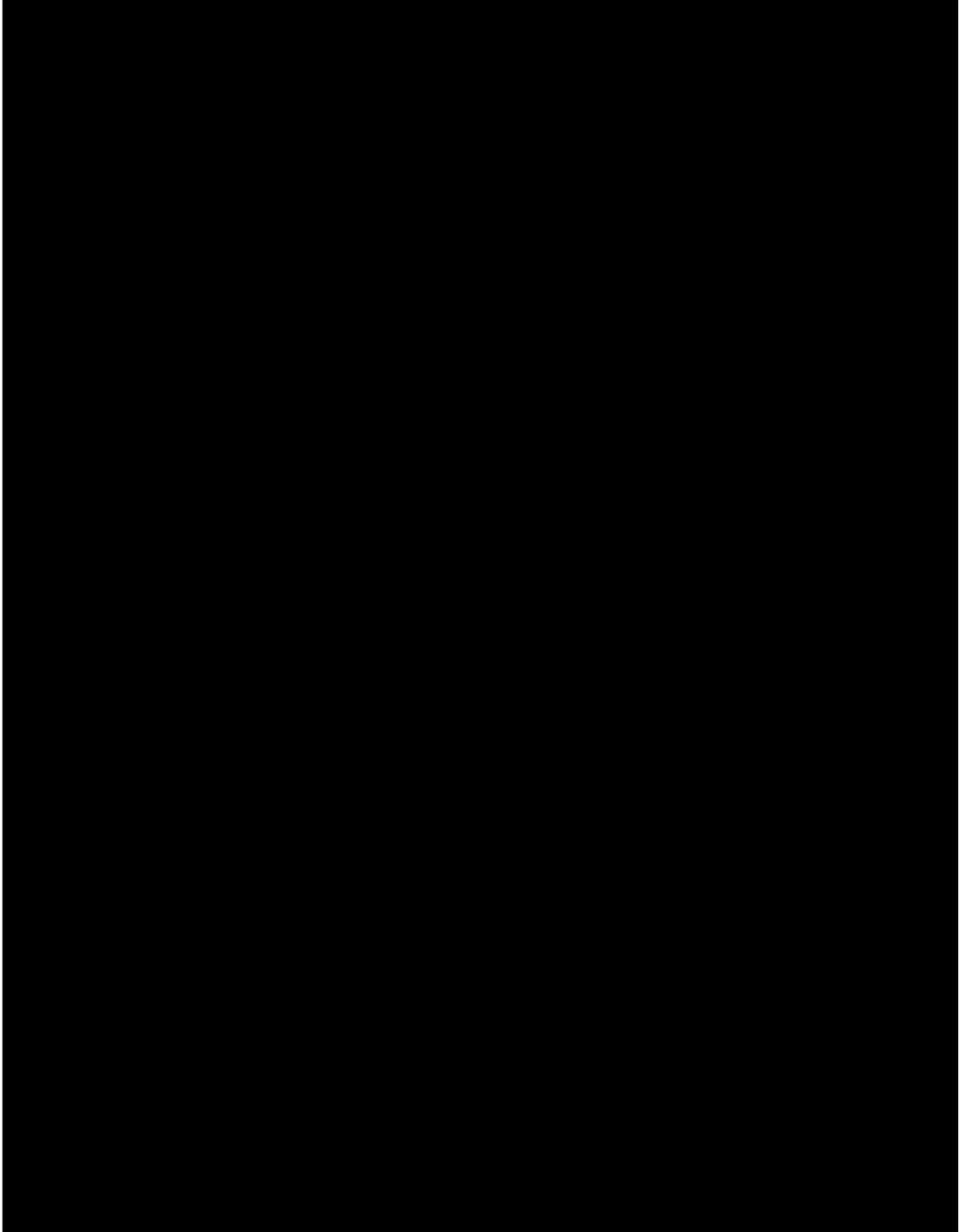
REDACTED Boston Gas Company and Colonial Gas Company
each d/b/a National Grid
D.P.U. 17-170
Attachment AG-21-39-41
Page 54 of 92



REDACTED

The Narragansett Electric Company
d/b/a National Grid
RIPUC Docket No. 4770
Attachment DIV 7-49-252
Page 55 of 92

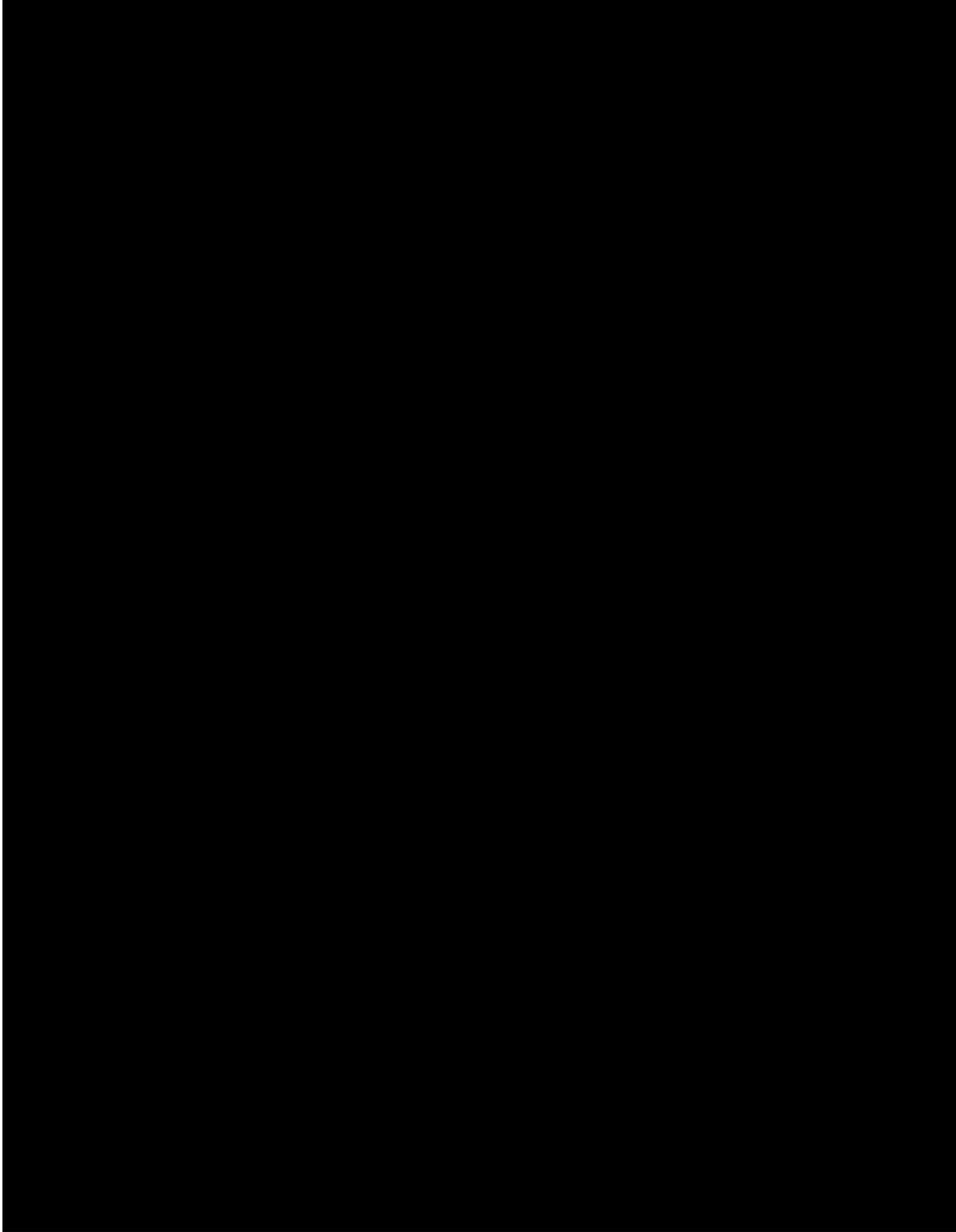
REDACTED Boston Gas Company and Colonial Gas Company
each d/b/a National Grid
D.P.U. 17-170
Attachment AG-21-39-41
Page 55 of 92



REDACTED

The Narragansett Electric Company
d/b/a National Grid
RIPUC Docket No. 4770
Attachment DIV 7-49-252
Page 56 of 92

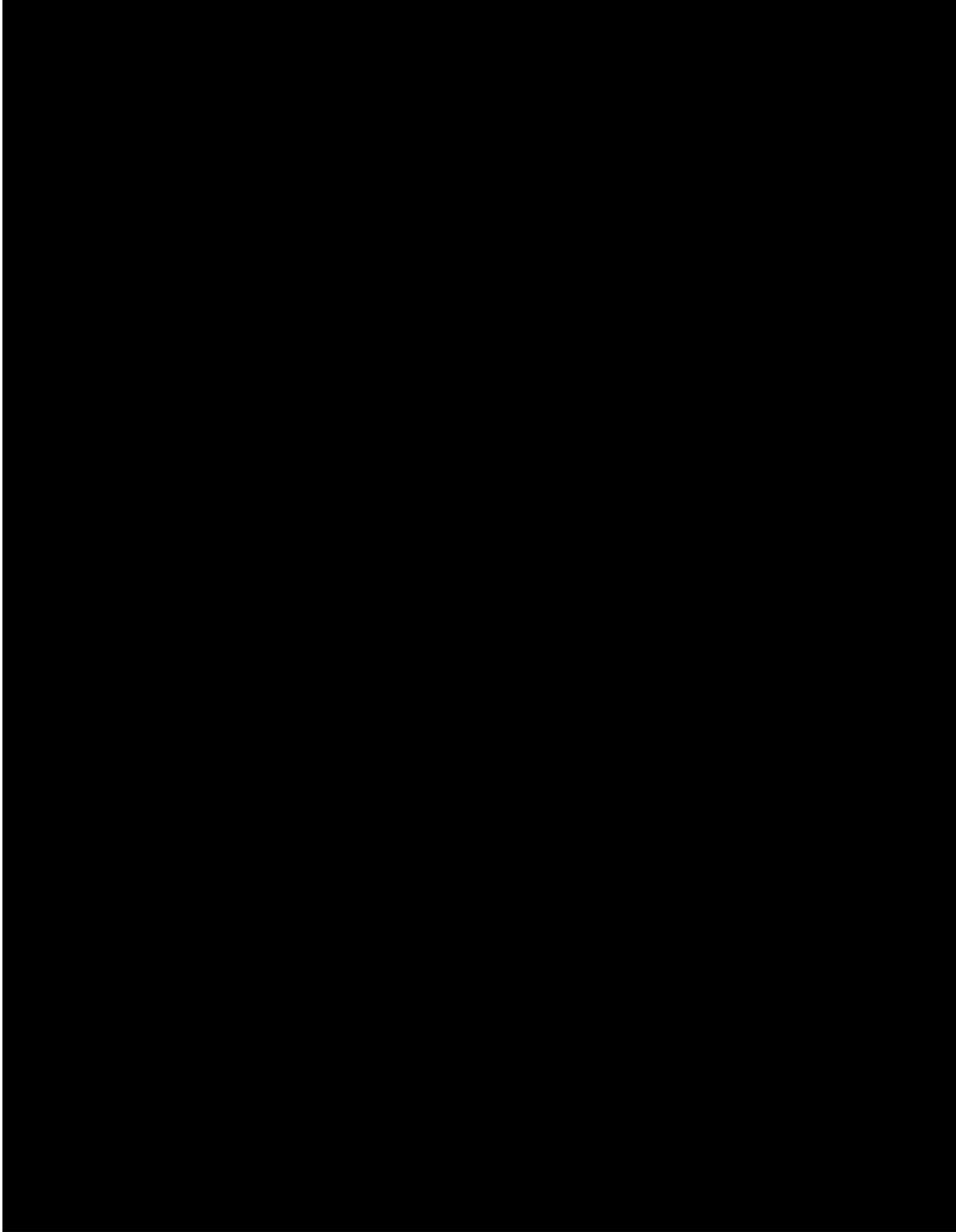
REDACTED Boston Gas Company and Colonial Gas Company
each d/b/a National Grid
D.P.U. 17-170
Attachment AG-21-39-41
Page 56 of 92



REDACTED

The Narragansett Electric Company
d/b/a National Grid
RIPUC Docket No. 4770
Attachment DIV 7-49-252
Page 57 of 92

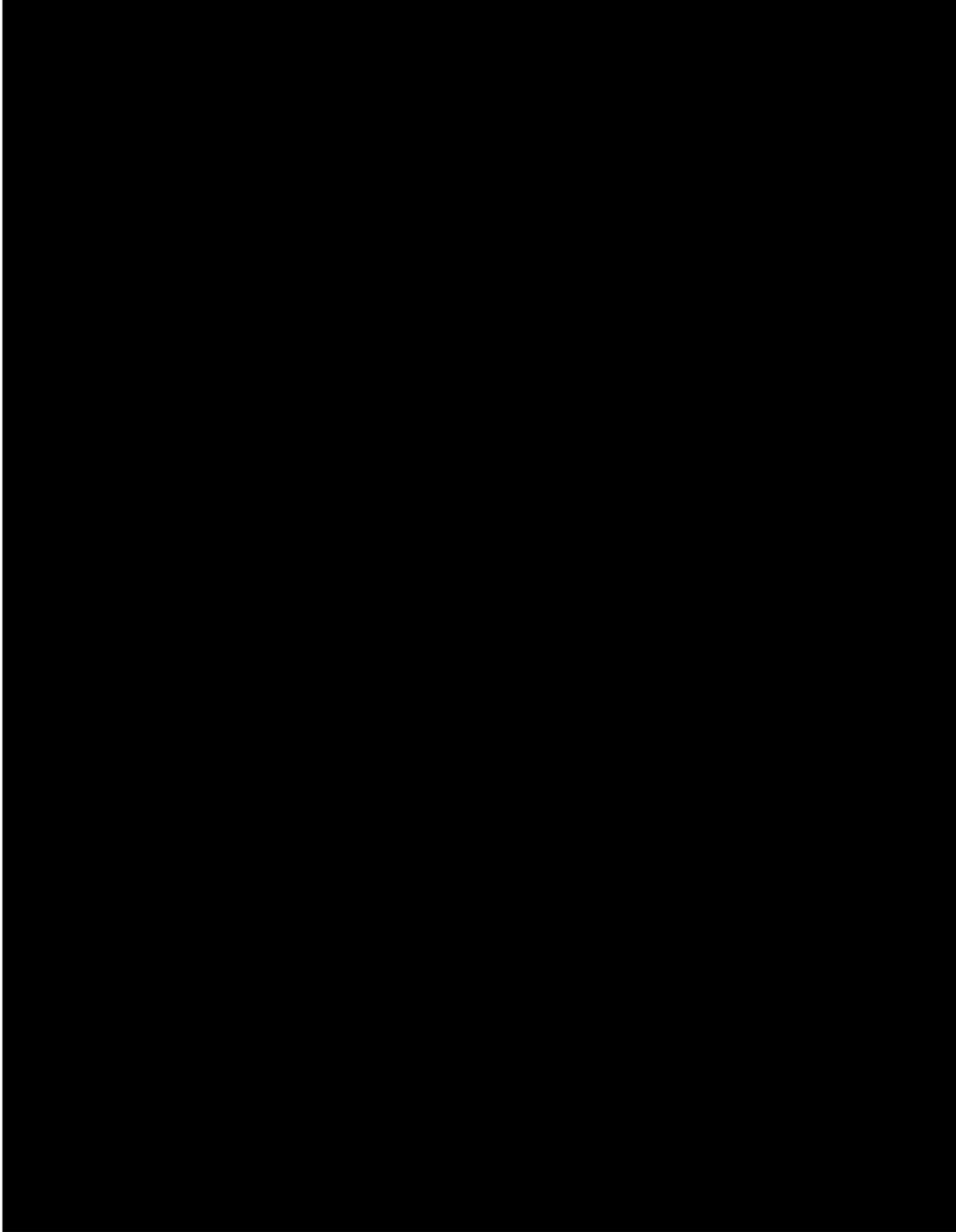
REDACTED Boston Gas Company and Colonial Gas Company
each d/b/a National Grid
D.P.U. 17-170
Attachment AG-21-39-41
Page 57 of 92



REDACTED

The Narragansett Electric Company
d/b/a National Grid
RIPUC Docket No. 4770
Attachment DIV 7-49-252
Page 58 of 92

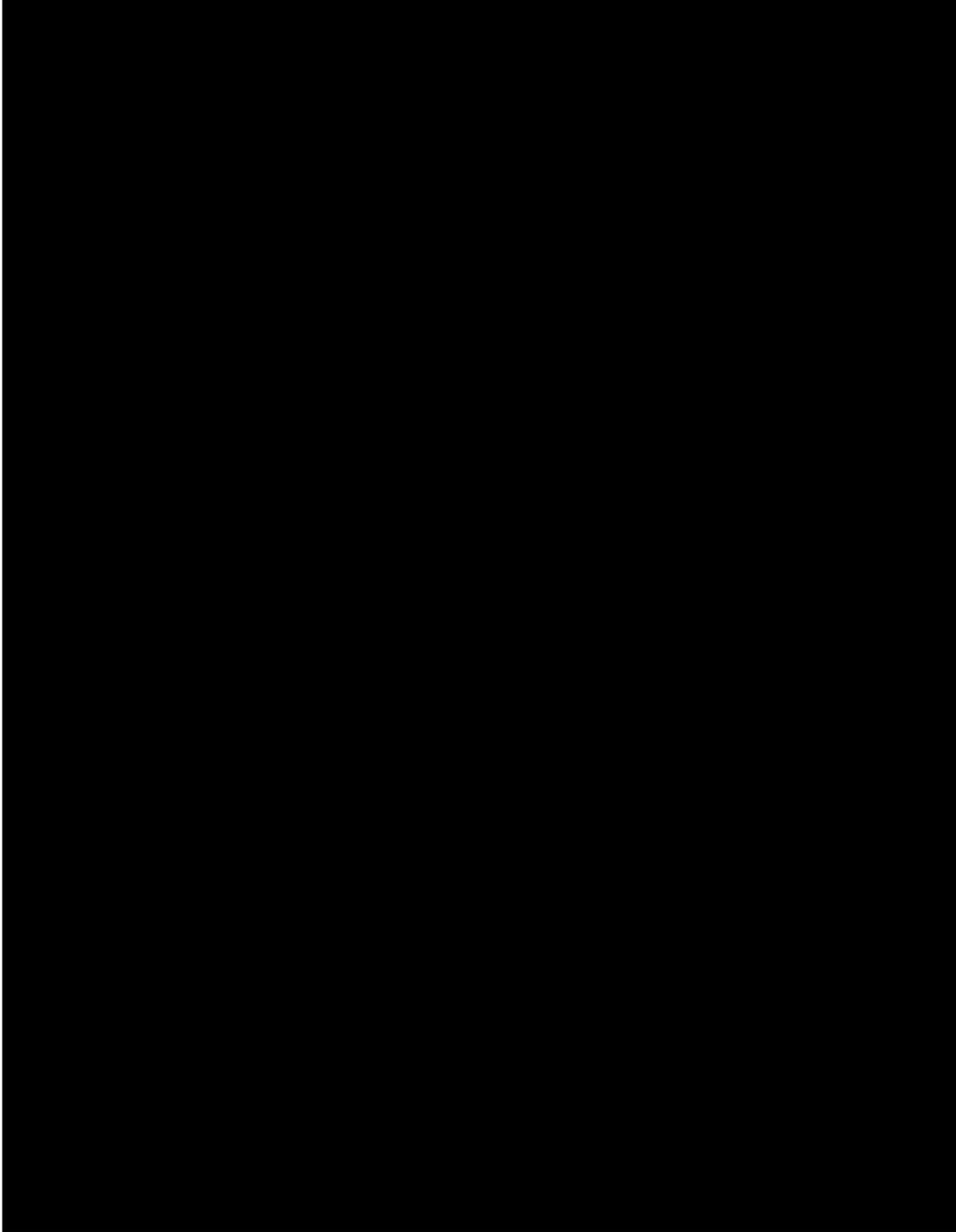
REDACTED Boston Gas Company and Colonial Gas Company
each d/b/a National Grid
D.P.U. 17-170
Attachment AG-21-39-41
Page 58 of 92



REDACTED

The Narragansett Electric Company
d/b/a National Grid
RIPUC Docket No. 4770
Attachment DIV 7-49-252
Page 59 of 92

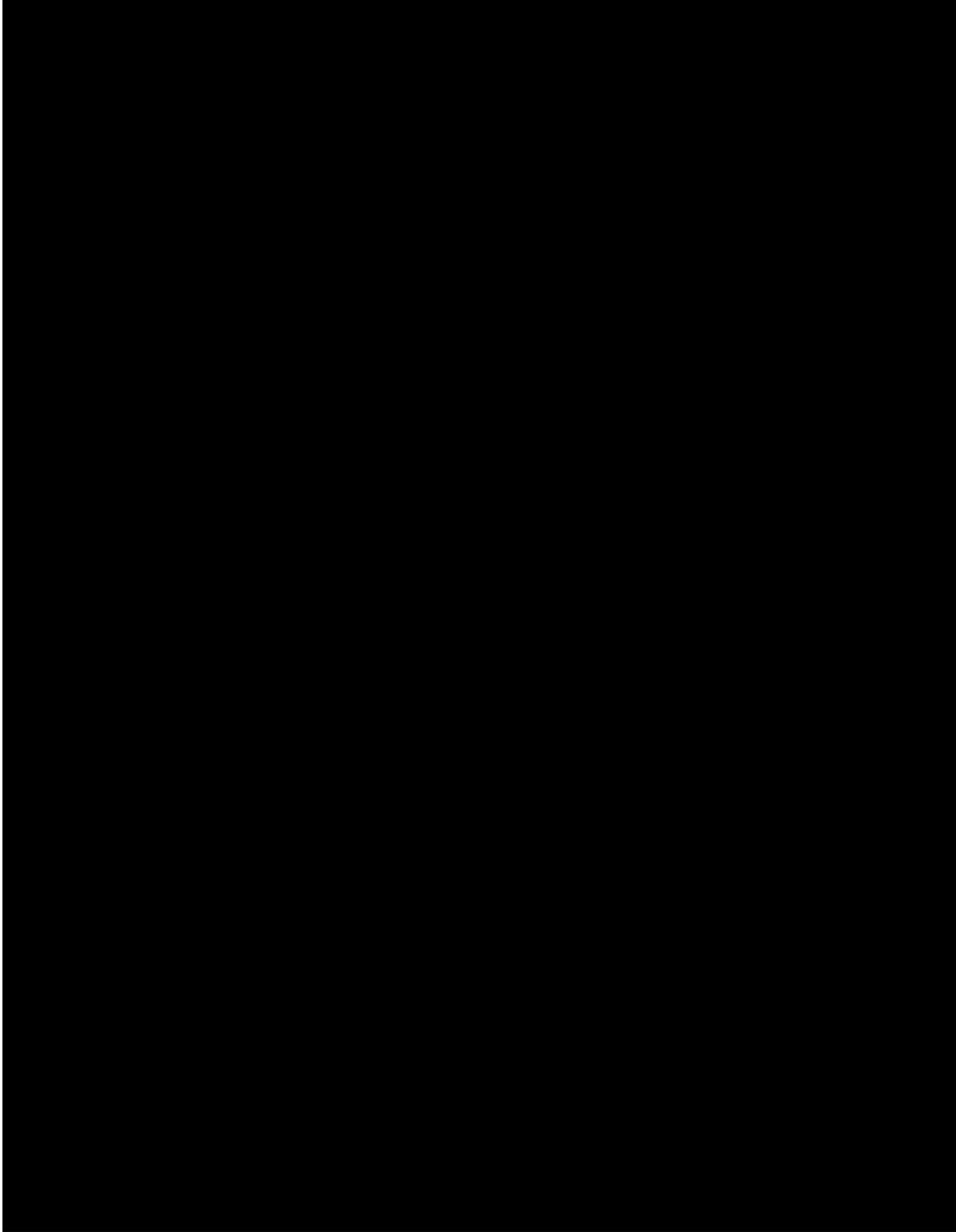
REDACTED Boston Gas Company and Colonial Gas Company
each d/b/a National Grid
D.P.U. 17-170
Attachment AG-21-39-41
Page 59 of 92



REDACTED

The Narragansett Electric Company
d/b/a National Grid
RIPUC Docket No. 4770
Attachment DIV 7-49-252
Page 60 of 92

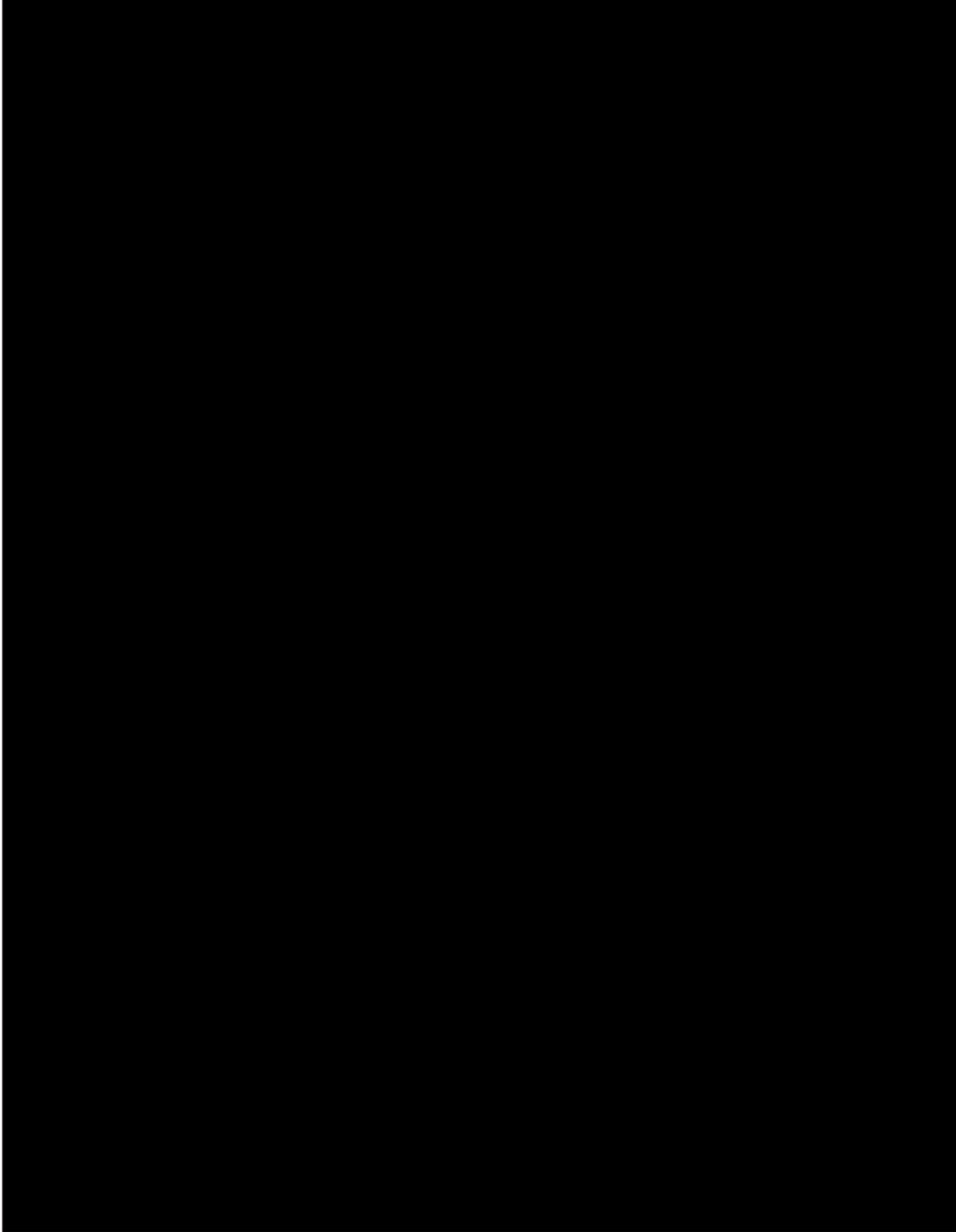
REDACTED Boston Gas Company and Colonial Gas Company
each d/b/a National Grid
D.P.U. 17-170
Attachment AG-21-39-41
Page 60 of 92



REDACTED

The Narragansett Electric Company
d/b/a National Grid
RIPUC Docket No. 4770
Attachment DIV 7-49-252
Page 61 of 92

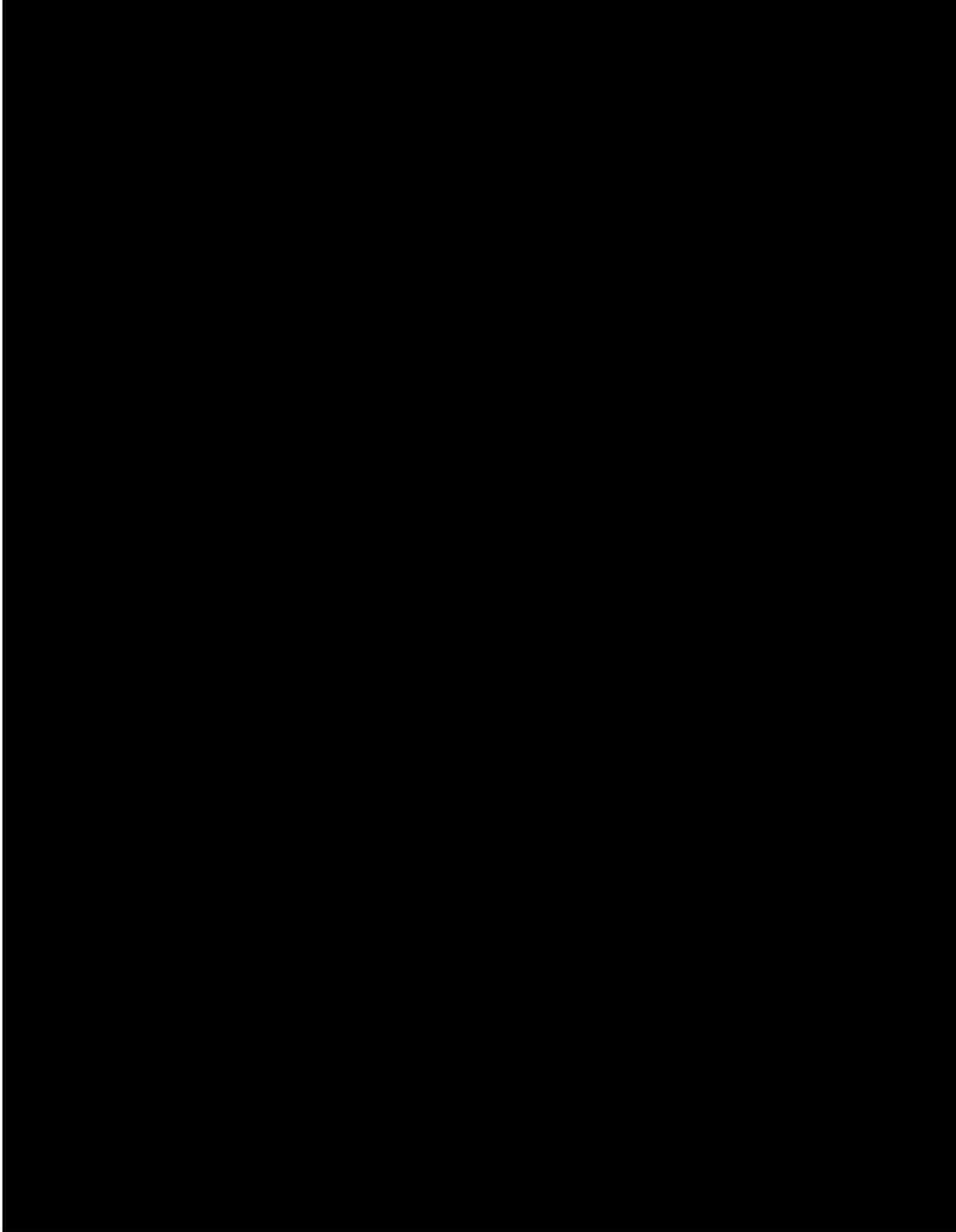
REDACTED Boston Gas Company and Colonial Gas Company
each d/b/a National Grid
D.P.U. 17-170
Attachment AG-21-39-41
Page 61 of 92



REDACTED

The Narragansett Electric Company
d/b/a National Grid
RIPUC Docket No. 4770
Attachment DIV 7-49-252
Page 62 of 92

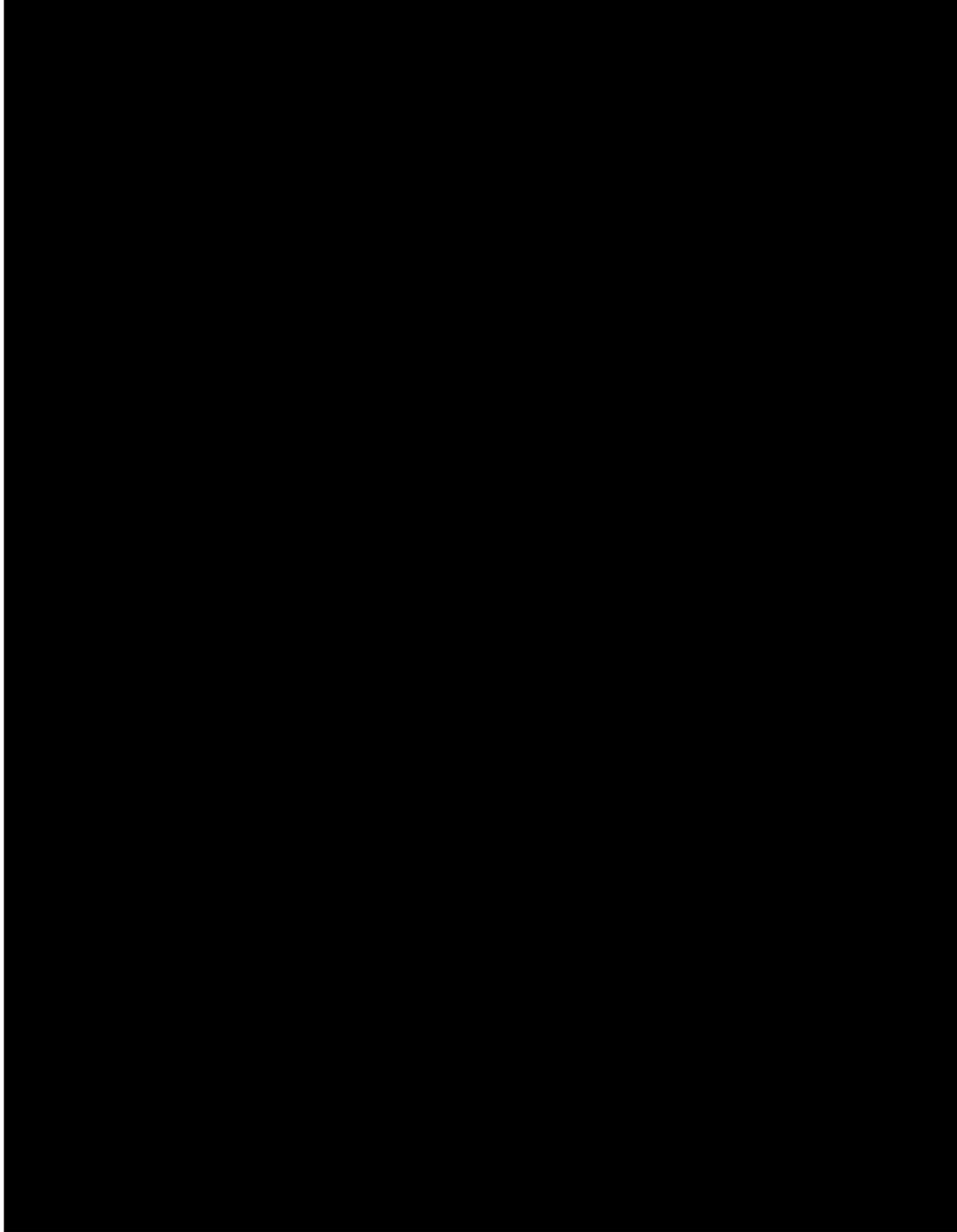
REDACTED Boston Gas Company and Colonial Gas Company
each d/b/a National Grid
D.P.U. 17-170
Attachment AG-21-39-41
Page 62 of 92



REDACTED

The Narragansett Electric Company
d/b/a National Grid
RIPUC Docket No. 4770
Attachment DIV 7-49-252
Page 63 of 92

REDACTED Boston Gas Company and Colonial Gas Company
each d/b/a National Grid
D.P.U. 17-170
Attachment AG-21-39-41
Page 63 of 92

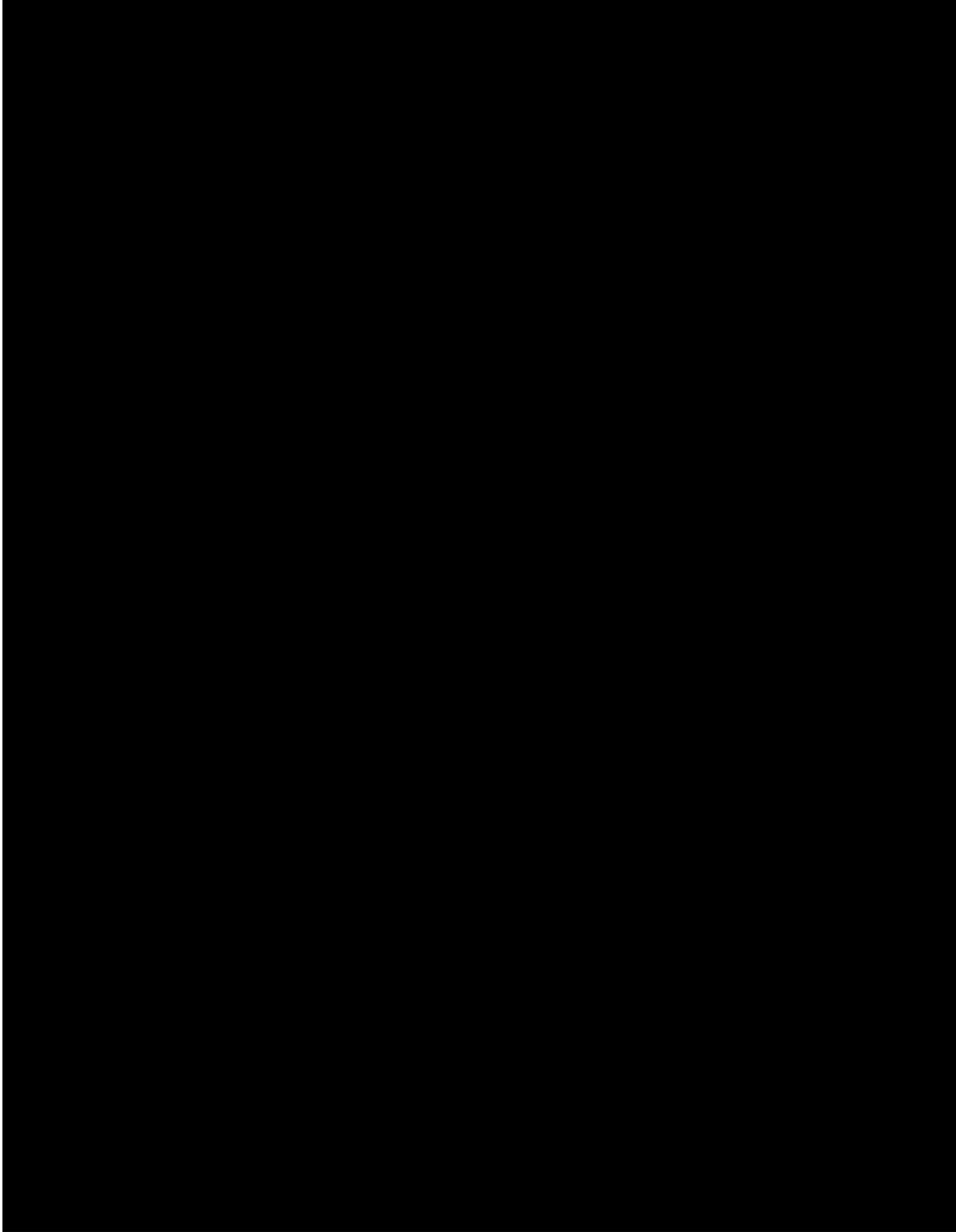


REDACTED

The Narragansett Electric Company
d/b/a National Grid
RIPUC Docket No. 4770
Attachment DIV 7-49-252
Page 64 of 92

REDACTED

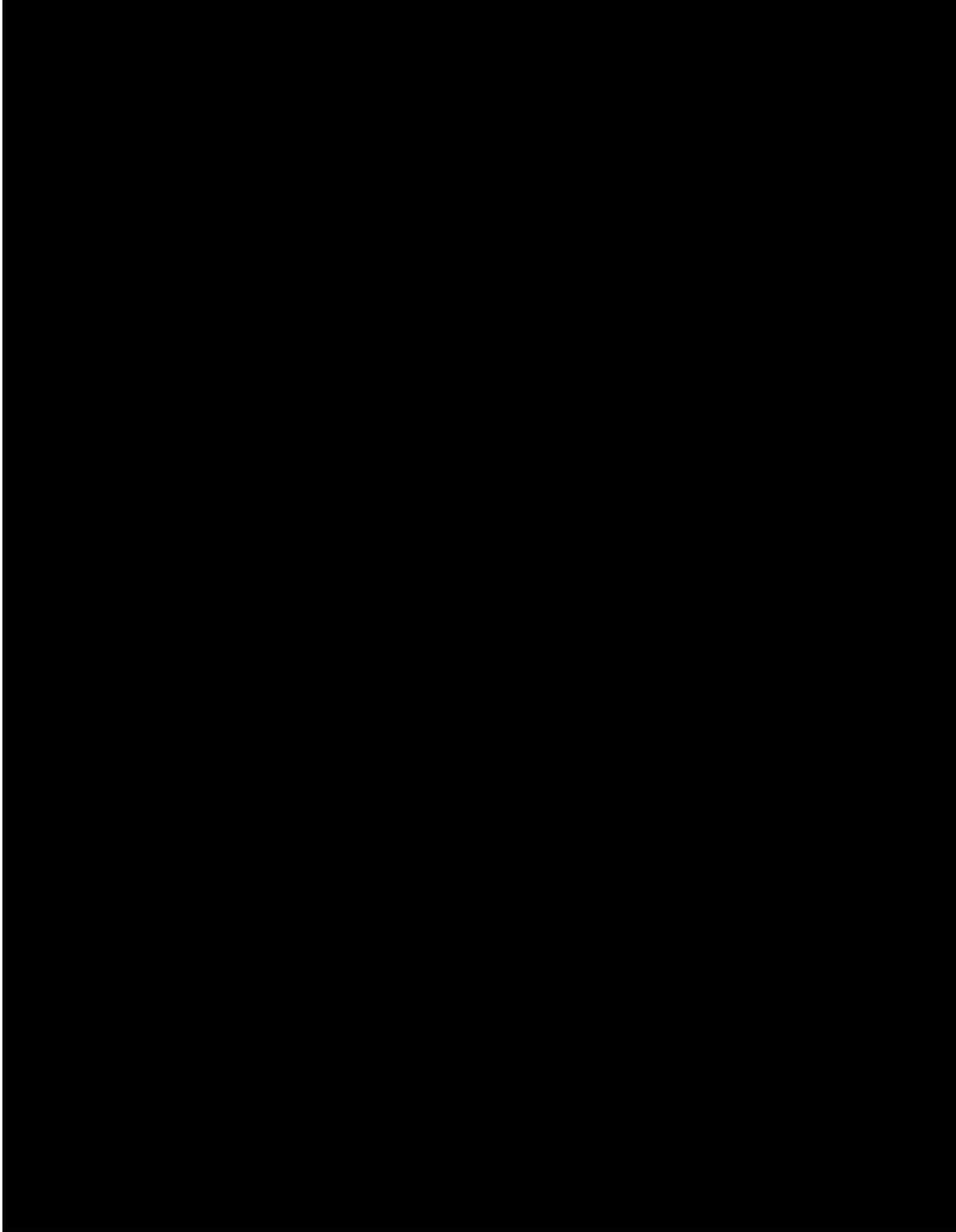
Boston Gas Company and Colonial Gas Company
each d/b/a National Grid
D.P.U. 17-170
Attachment AG-21-39-41
Page 64 of 92



REDACTED

The Narragansett Electric Company
d/b/a National Grid
RIPUC Docket No. 4770
Attachment DIV 7-49-252
Page 65 of 92

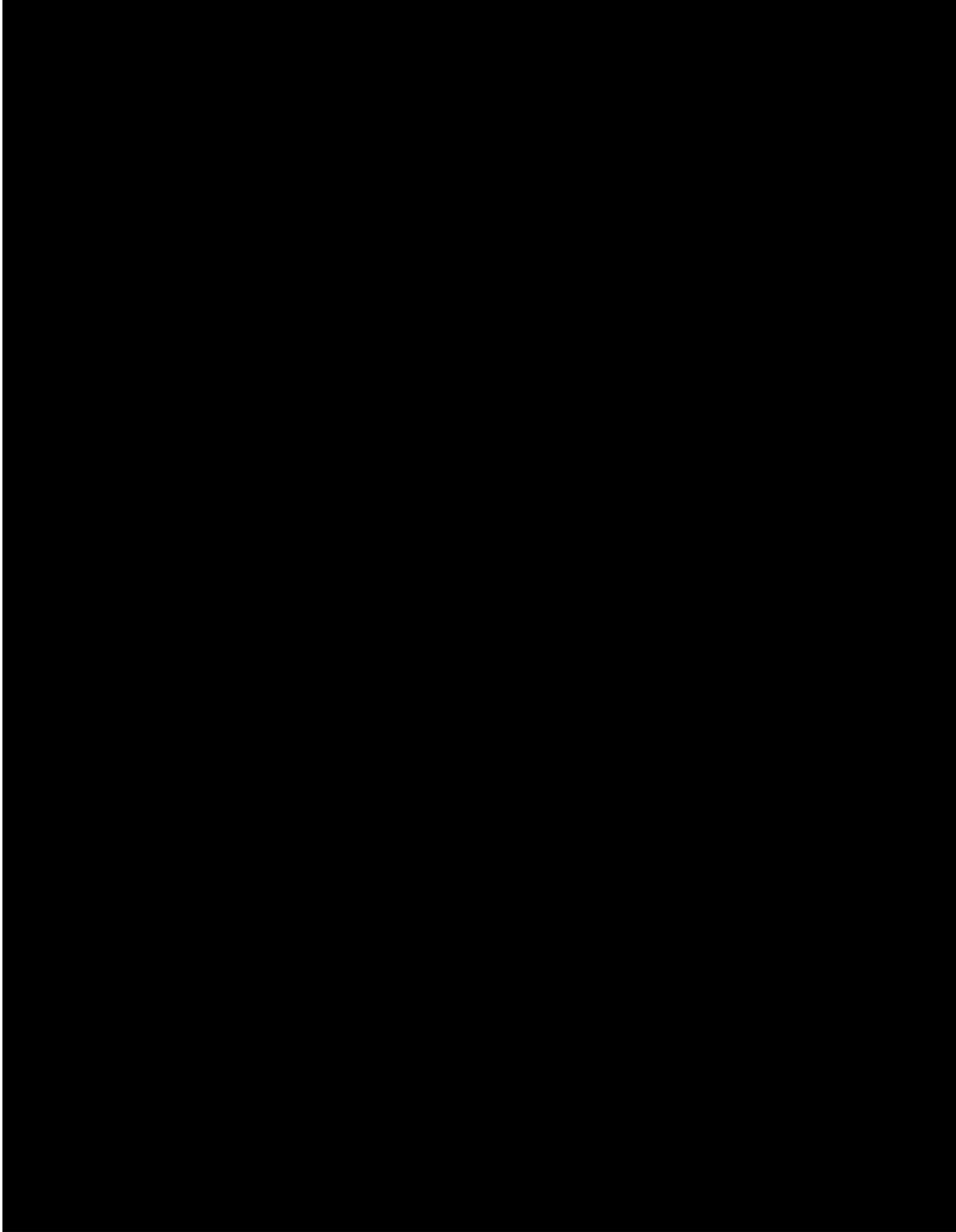
REDACTED Boston Gas Company and Colonial Gas Company
each d/b/a National Grid
D.P.U. 17-170
Attachment AG-21-39-41
Page 65 of 92



REDACTED

The Narragansett Electric Company
d/b/a National Grid
RIPUC Docket No. 4770
Attachment DIV 7-49-252
Page 66 of 92

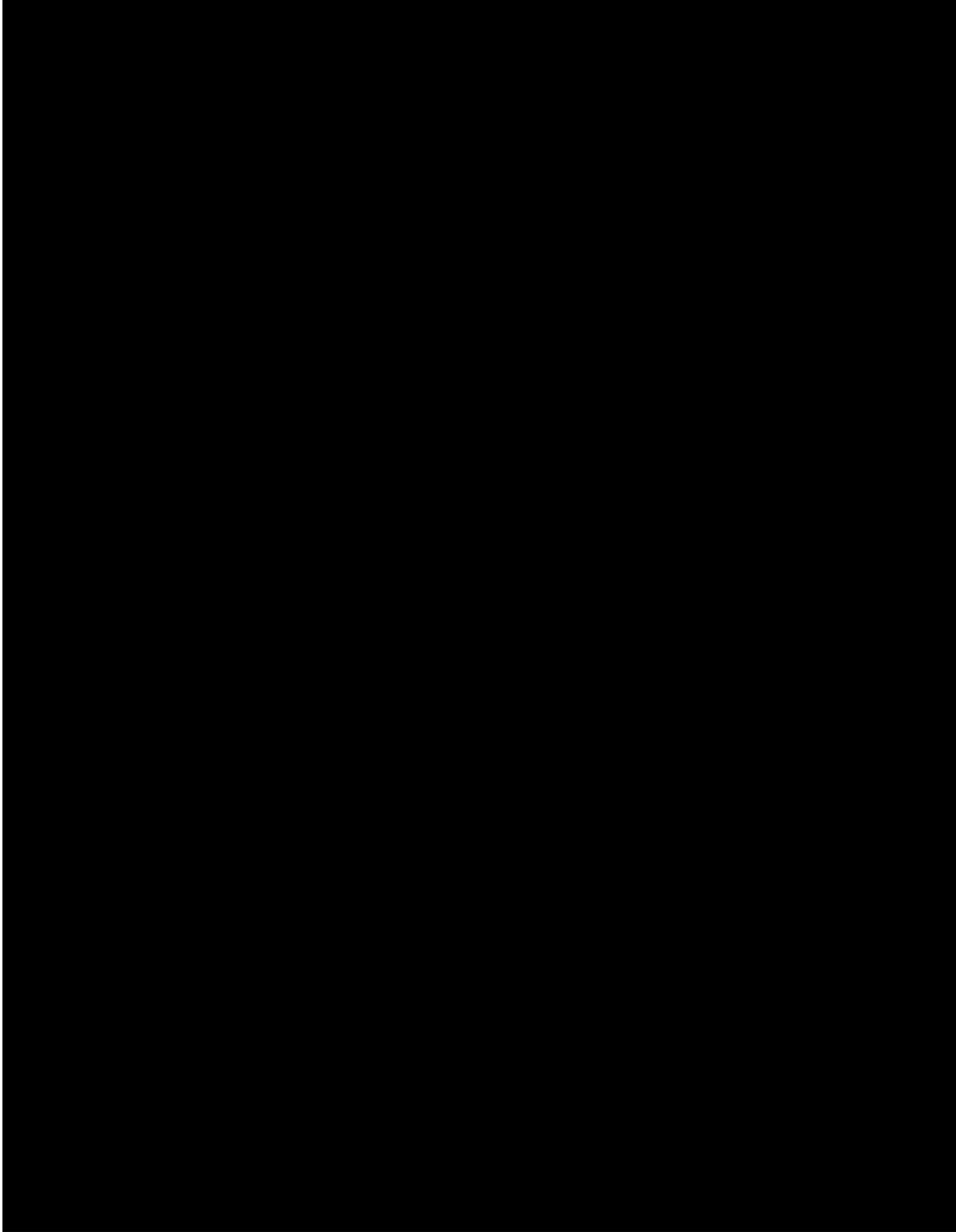
REDACTED Boston Gas Company and Colonial Gas Company
each d/b/a National Grid
D.P.U. 17-170
Attachment AG-21-39-41
Page 66 of 92



REDACTED

The Narragansett Electric Company
d/b/a National Grid
RIPUC Docket No. 4770
Attachment DIV 7-49-252
Page 67 of 92

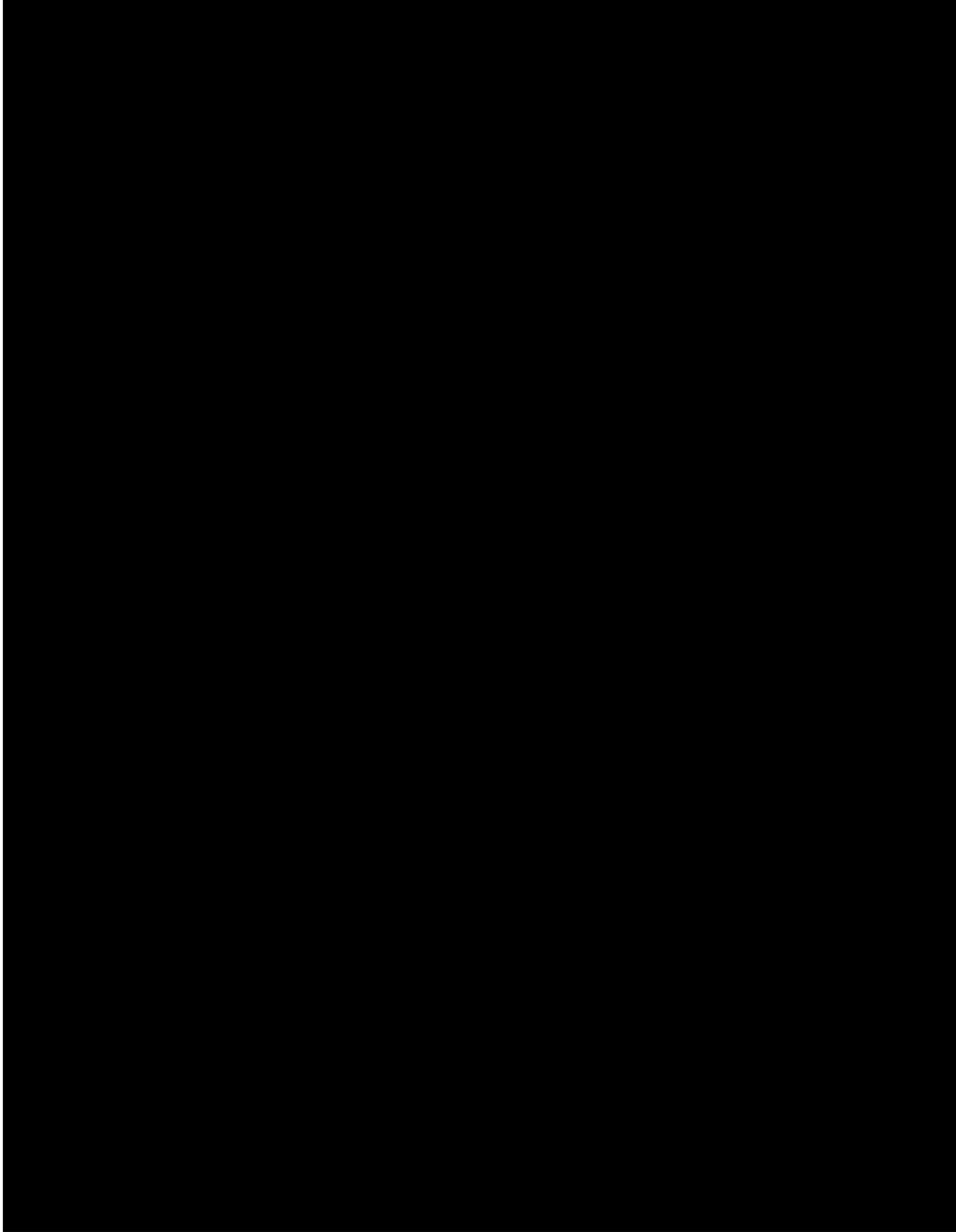
REDACTED Boston Gas Company and Colonial Gas Company
each d/b/a National Grid
D.P.U. 17-170
Attachment AG-21-39-41
Page 67 of 92



REDACTED

The Narragansett Electric Company
d/b/a National Grid
RIPUC Docket No. 4770
Attachment DIV 7-49-252
Page 68 of 92

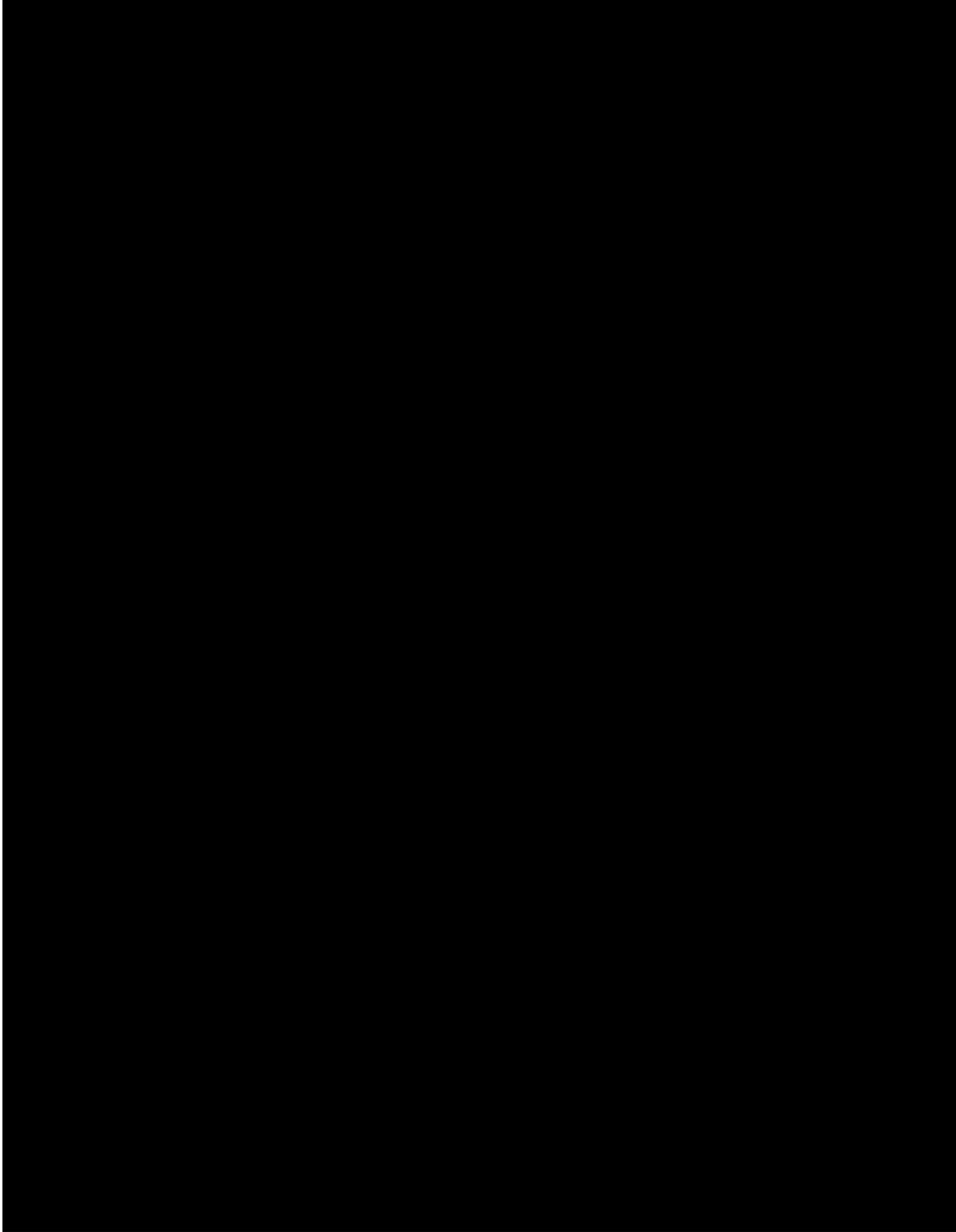
REDACTED Boston Gas Company and Colonial Gas Company
each d/b/a National Grid
D.P.U. 17-170
Attachment AG-21-39-41
Page 68 of 92



REDACTED

The Narragansett Electric Company
d/b/a National Grid
RIPUC Docket No. 4770
Attachment DIV 7-49-252
Page 69 of 92

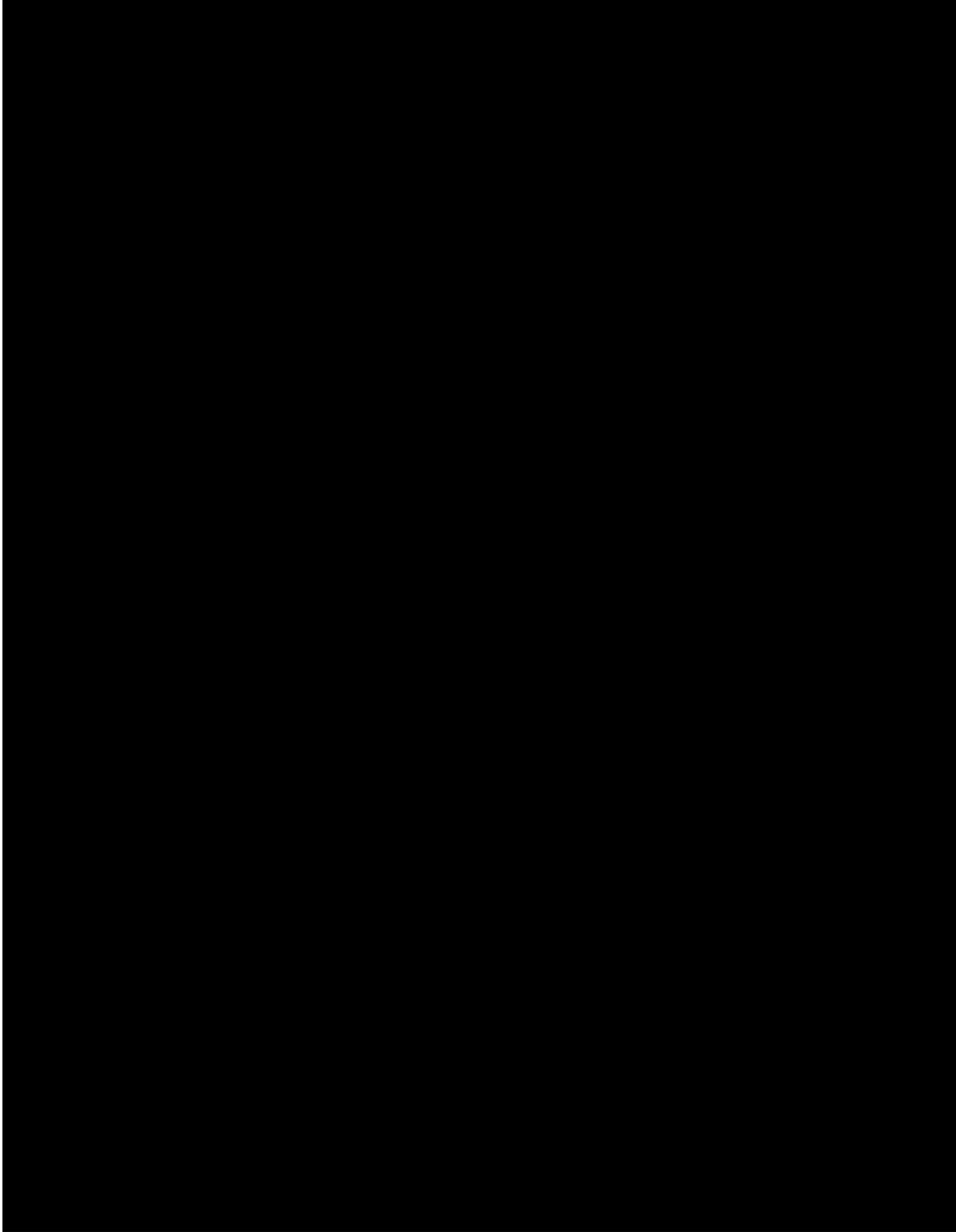
REDACTED Boston Gas Company and Colonial Gas Company
each d/b/a National Grid
D.P.U. 17-170
Attachment AG-21-39-41
Page 69 of 92



REDACTED

The Narragansett Electric Company
d/b/a National Grid
RIPUC Docket No. 4770
Attachment DIV 7-49-252
Page 70 of 92

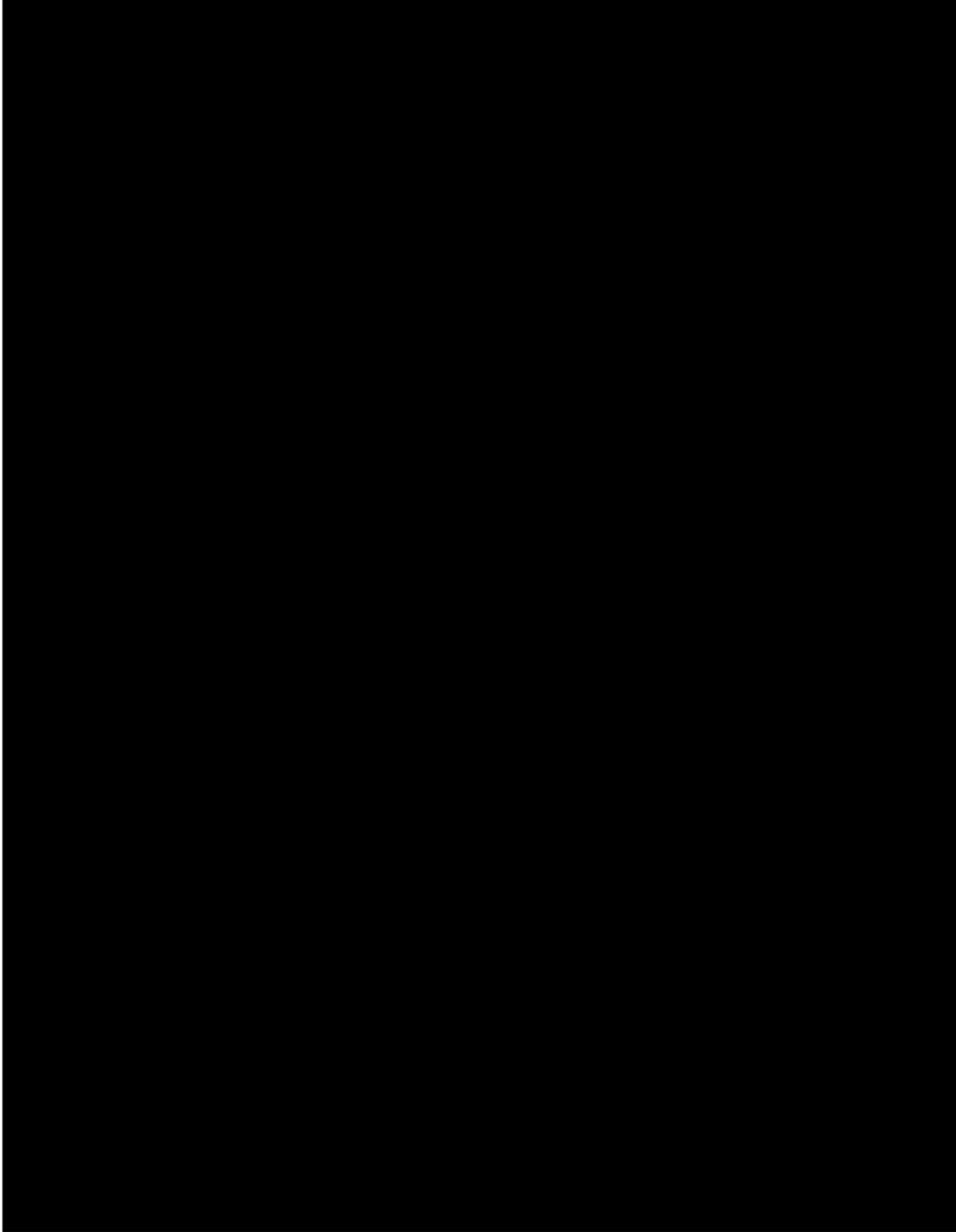
REDACTED Boston Gas Company and Colonial Gas Company
each d/b/a National Grid
D.P.U. 17-170
Attachment AG-21-39-41
Page 70 of 92



REDACTED

The Narragansett Electric Company
d/b/a National Grid
RIPUC Docket No. 4770
Attachment DIV 7-49-252
Page 71 of 92

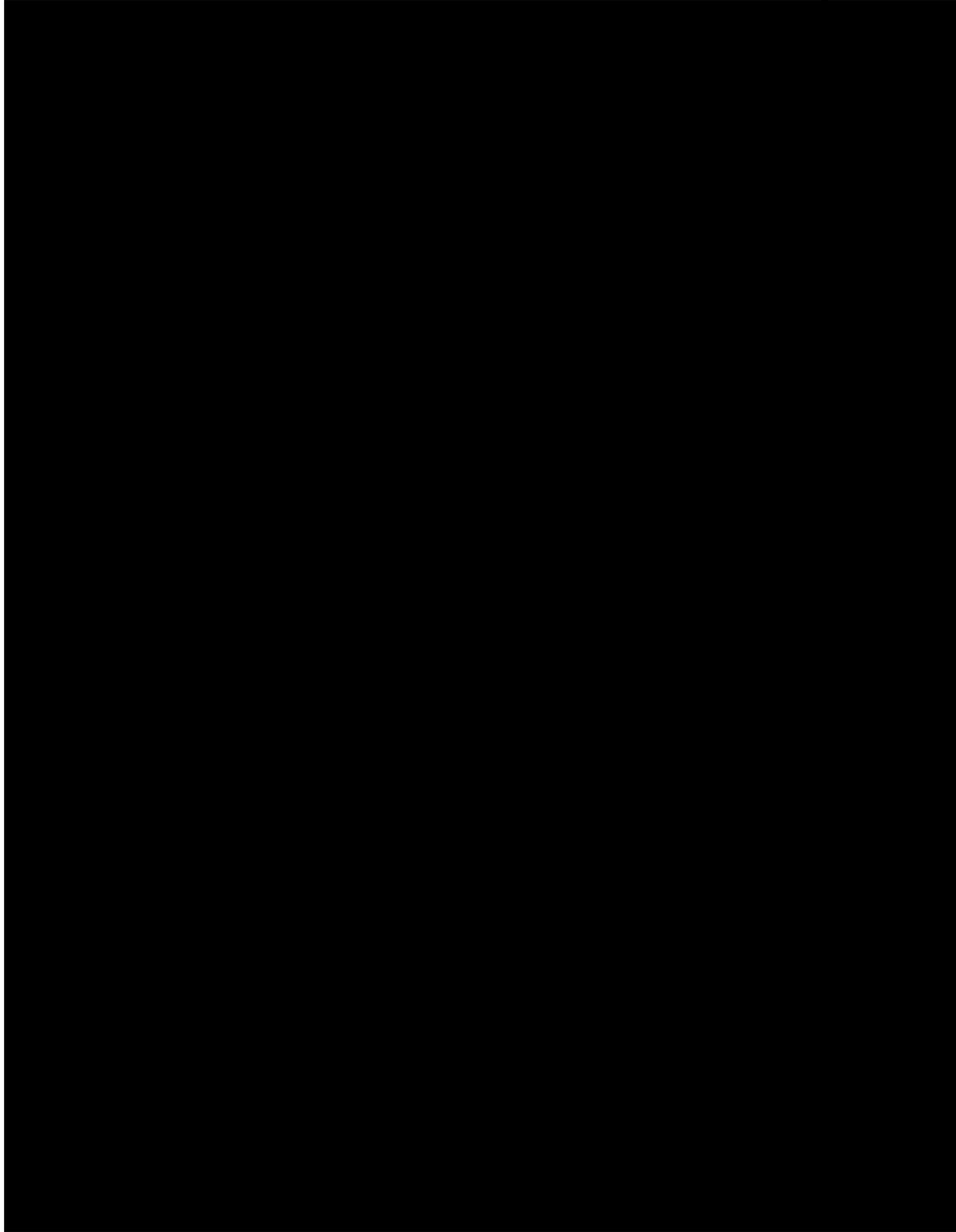
REDACTED Boston Gas Company and Colonial Gas Company
each d/b/a National Grid
D.P.U. 17-170
Attachment AG-21-39-41
Page 71 of 92



REDACTED

The Narragansett Electric Company
d/b/a National Grid
RIPUC Docket No. 4770
Attachment DIV 7-49-252
Page 72 of 92

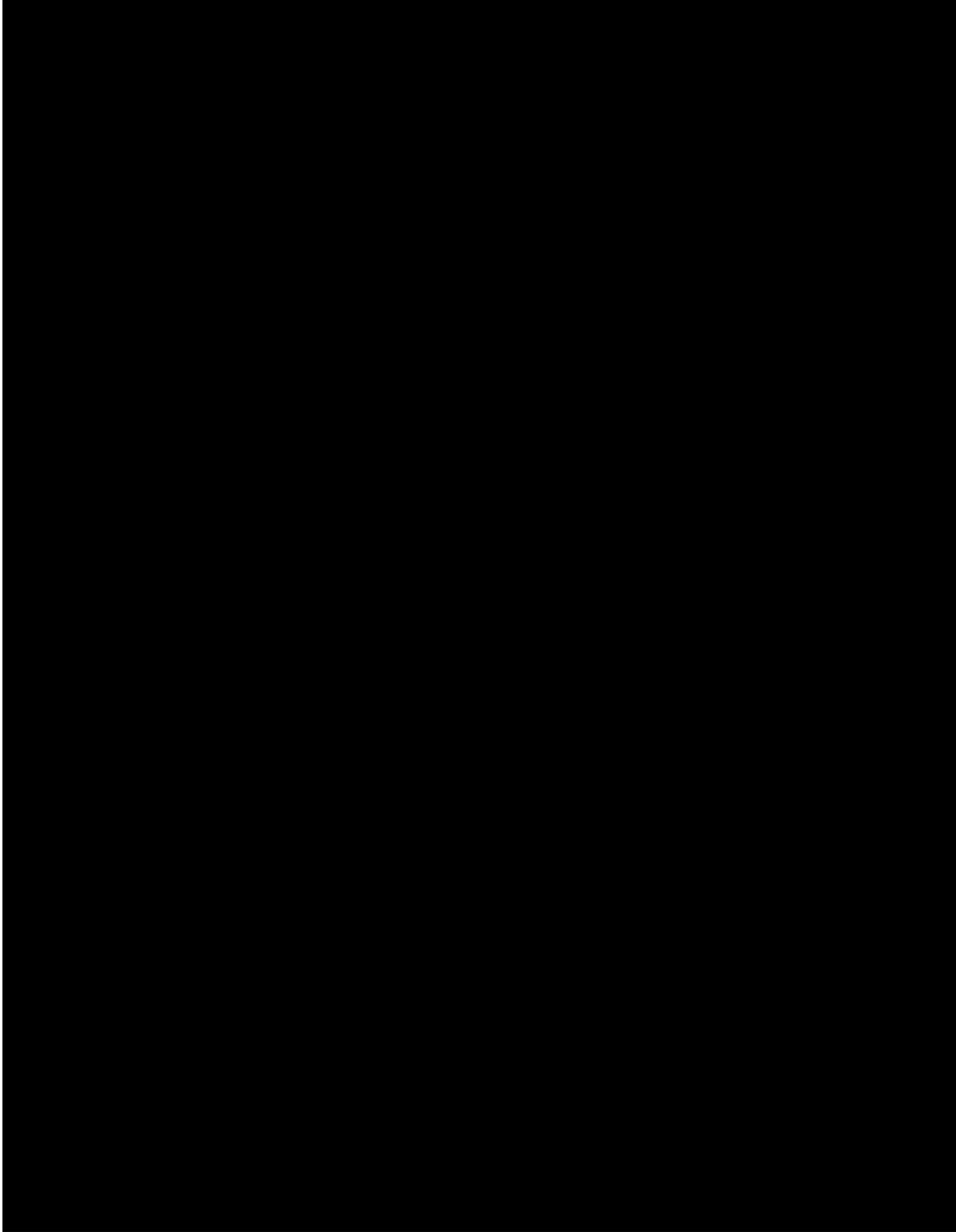
REDACTED Boston Gas Company and Colonial Gas Company
each d/b/a National Grid
D.P.U. 17-170
Attachment AG-21-39-41
Page 72 of 92



REDACTED

The Narragansett Electric Company
d/b/a National Grid
RIPUC Docket No. 4770
Attachment DIV 7-49-252
Page 73 of 92

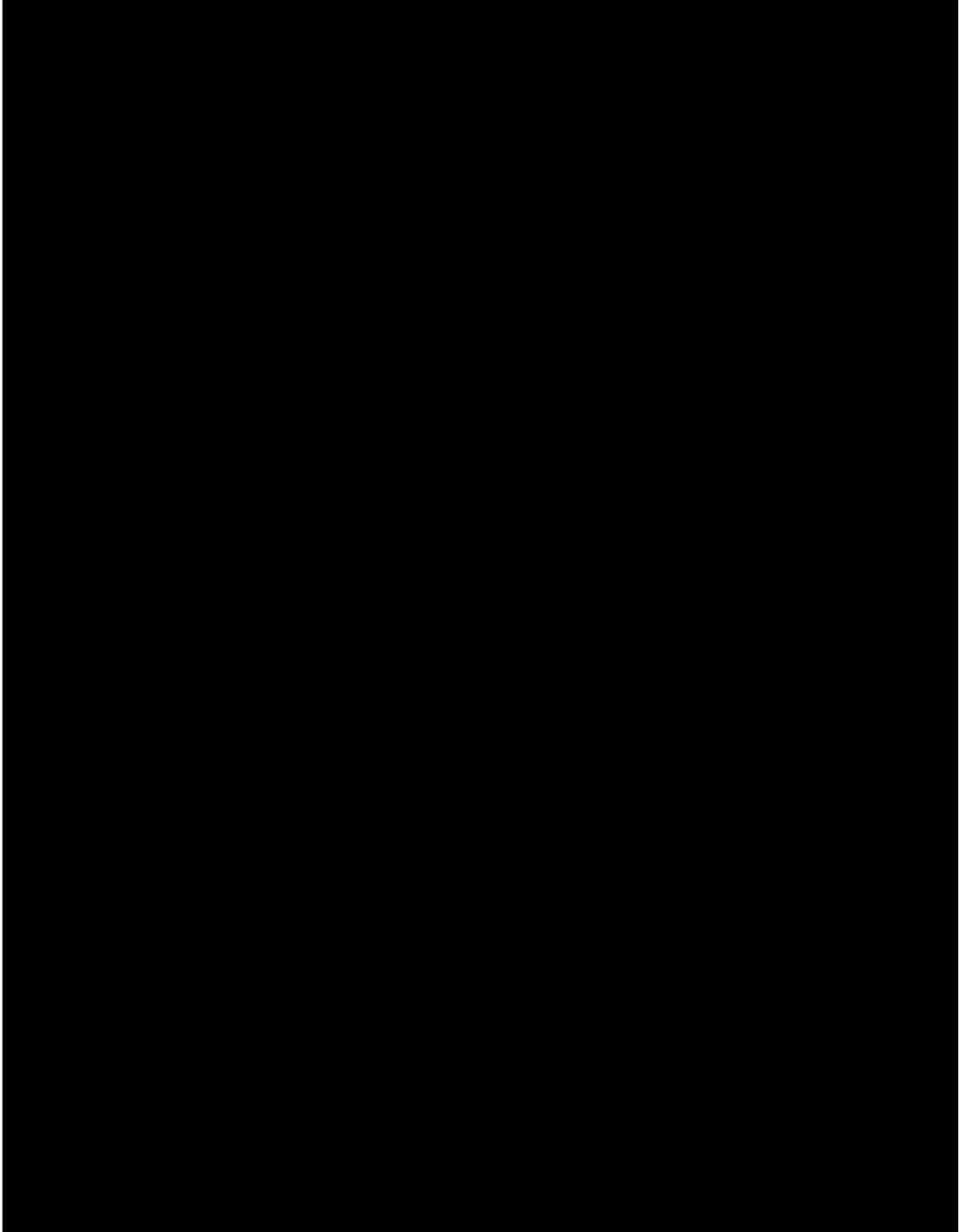
REDACTED Boston Gas Company and Colonial Gas Company
each d/b/a National Grid
D.P.U. 17-170
Attachment AG-21-39-41
Page 73 of 92



REDACTED

The Narragansett Electric Company
d/b/a National Grid
RIPUC Docket No. 4770
Attachment DIV 7-49-252
Page 74 of 92

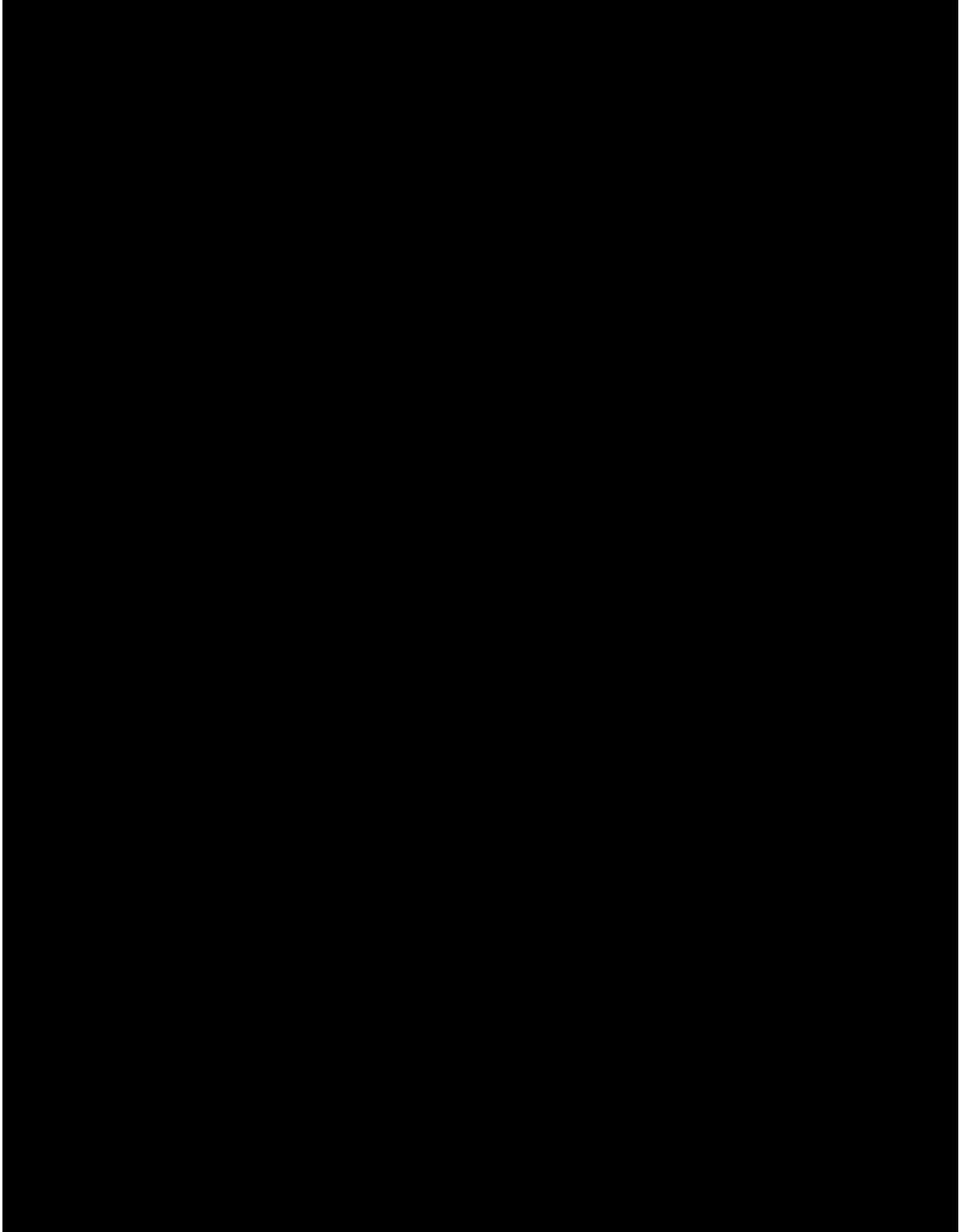
REDACTED Boston Gas Company and Colonial Gas Company
each d/b/a National Grid
D.P.U. 17-170
Attachment AG-21-39-41
Page 74 of 92



REDACTED

The Narragansett Electric Company
d/b/a National Grid
RIPUC Docket No. 4770
Attachment DIV 7-49-252
Page 75 of 92

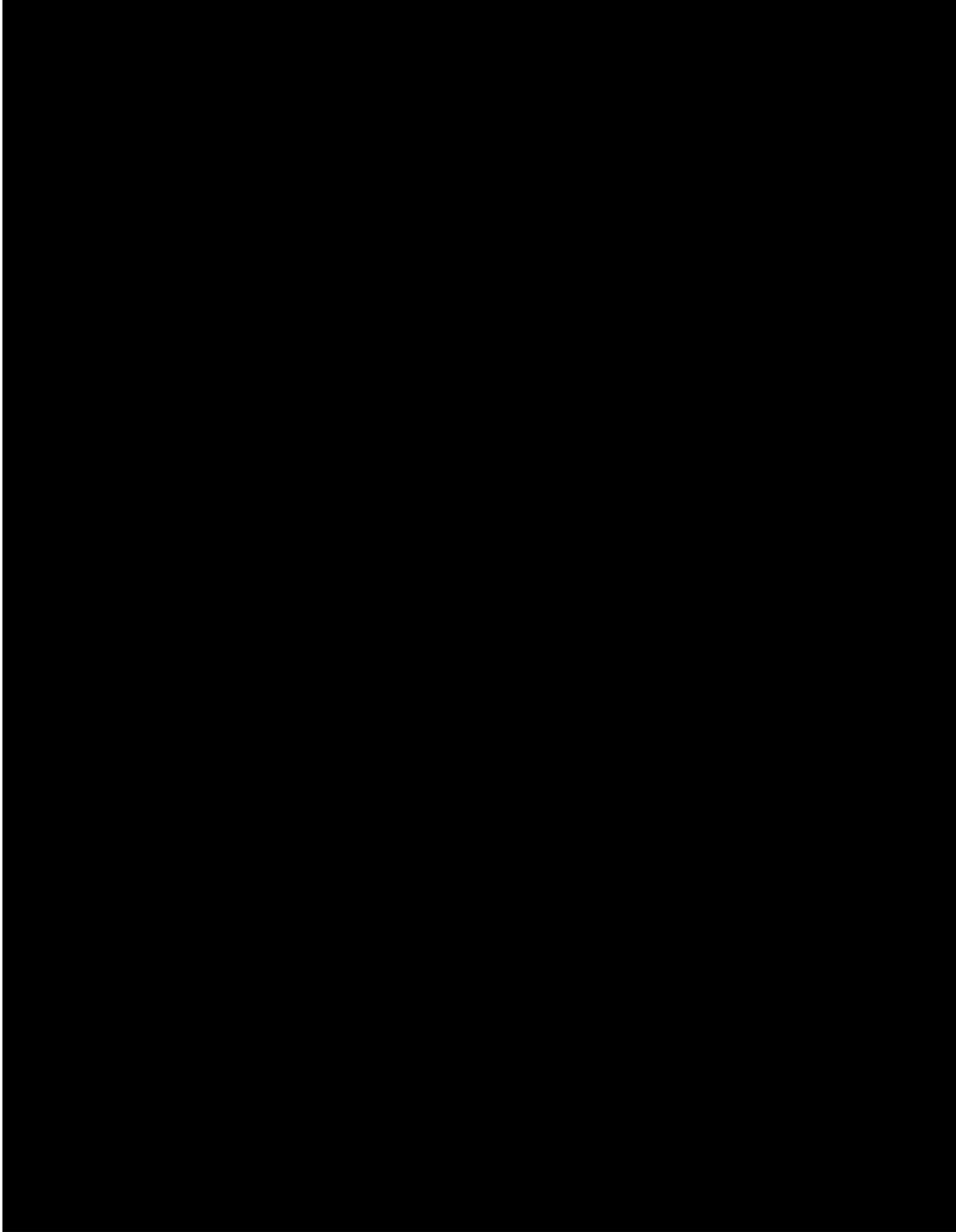
REDACTED Boston Gas Company and Colonial Gas Company
each d/b/a National Grid
D.P.U. 17-170
Attachment AG-21-39-41
Page 75 of 92



REDACTED

The Narragansett Electric Company
d/b/a National Grid
RIPUC Docket No. 4770
Attachment DIV 7-49-252
Page 76 of 92

REDACTED Boston Gas Company and Colonial Gas Company
each d/b/a National Grid
D.P.U. 17-170
Attachment AG-21-39-41
Page 76 of 92

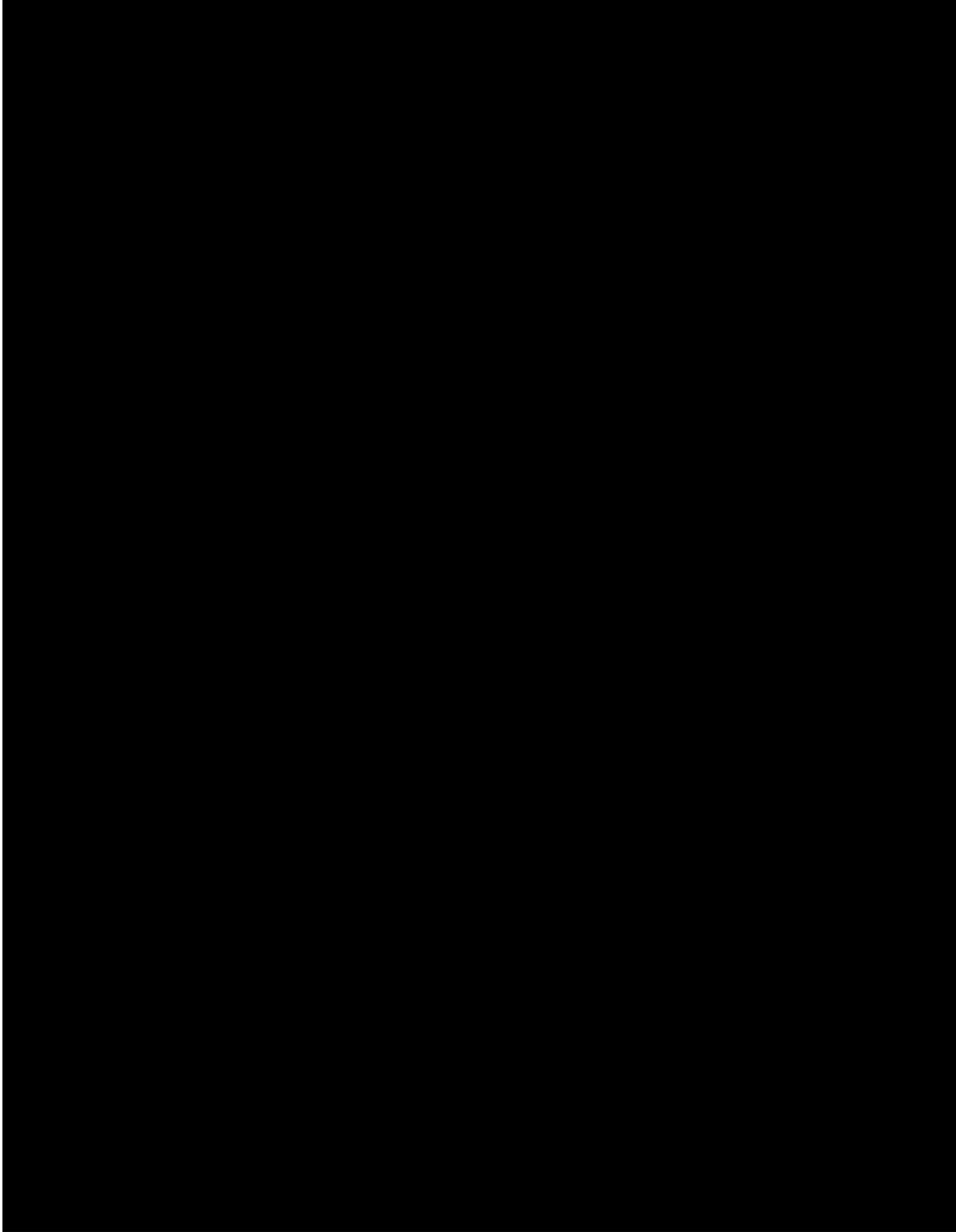


REDACTED

The Narragansett Electric Company
d/b/a National Grid
RIPUC Docket No. 4770
Attachment DIV 7-49-252
Page 77 of 92

REDACTED

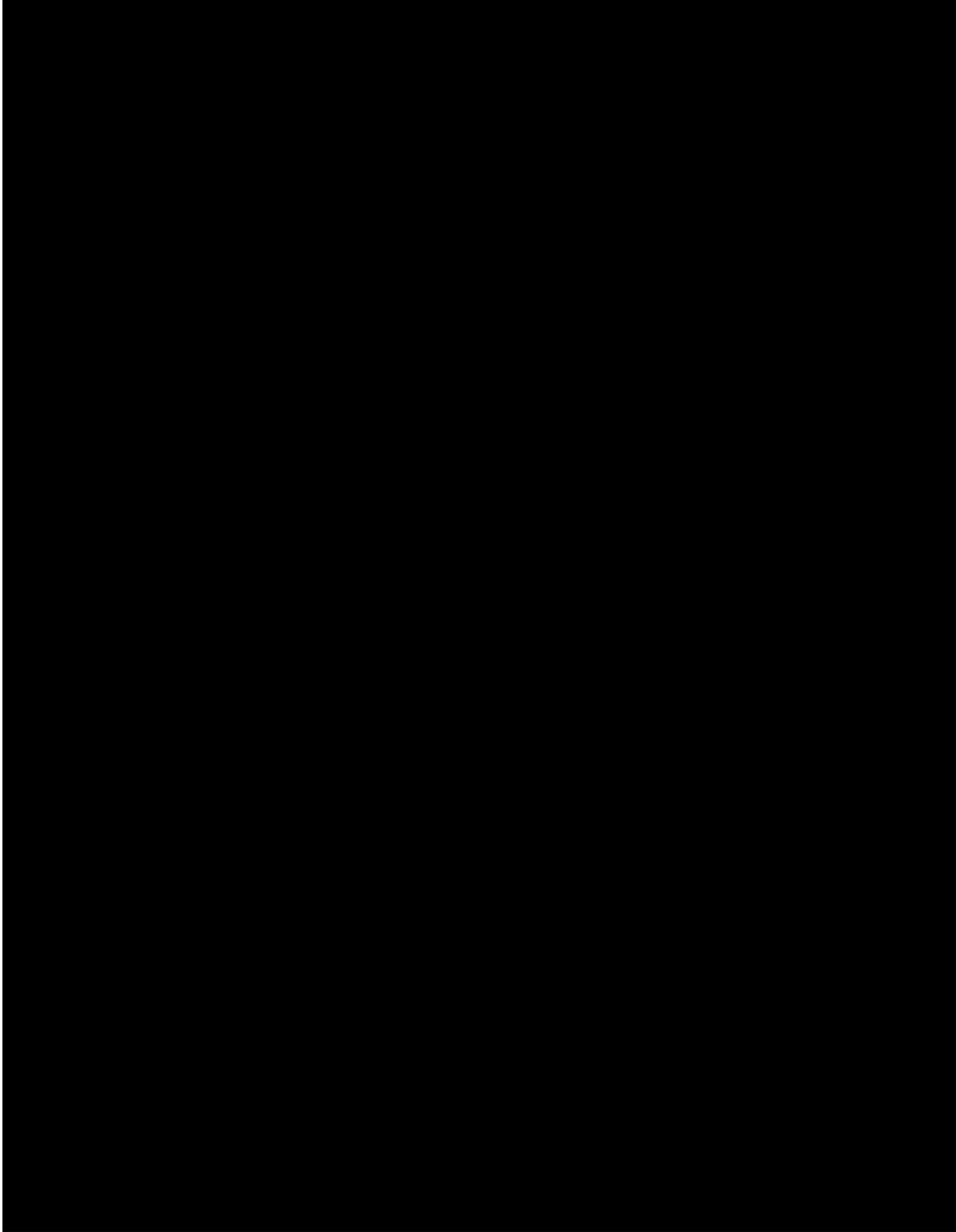
Boston Gas Company and Colonial Gas Company
each d/b/a National Grid
D.P.U. 17-170
Attachment AG-21-39-41
Page 77 of 92



REDACTED

The Narragansett Electric Company
d/b/a National Grid
RIPUC Docket No. 4770
Attachment DIV 7-49-252
Page 78 of 92

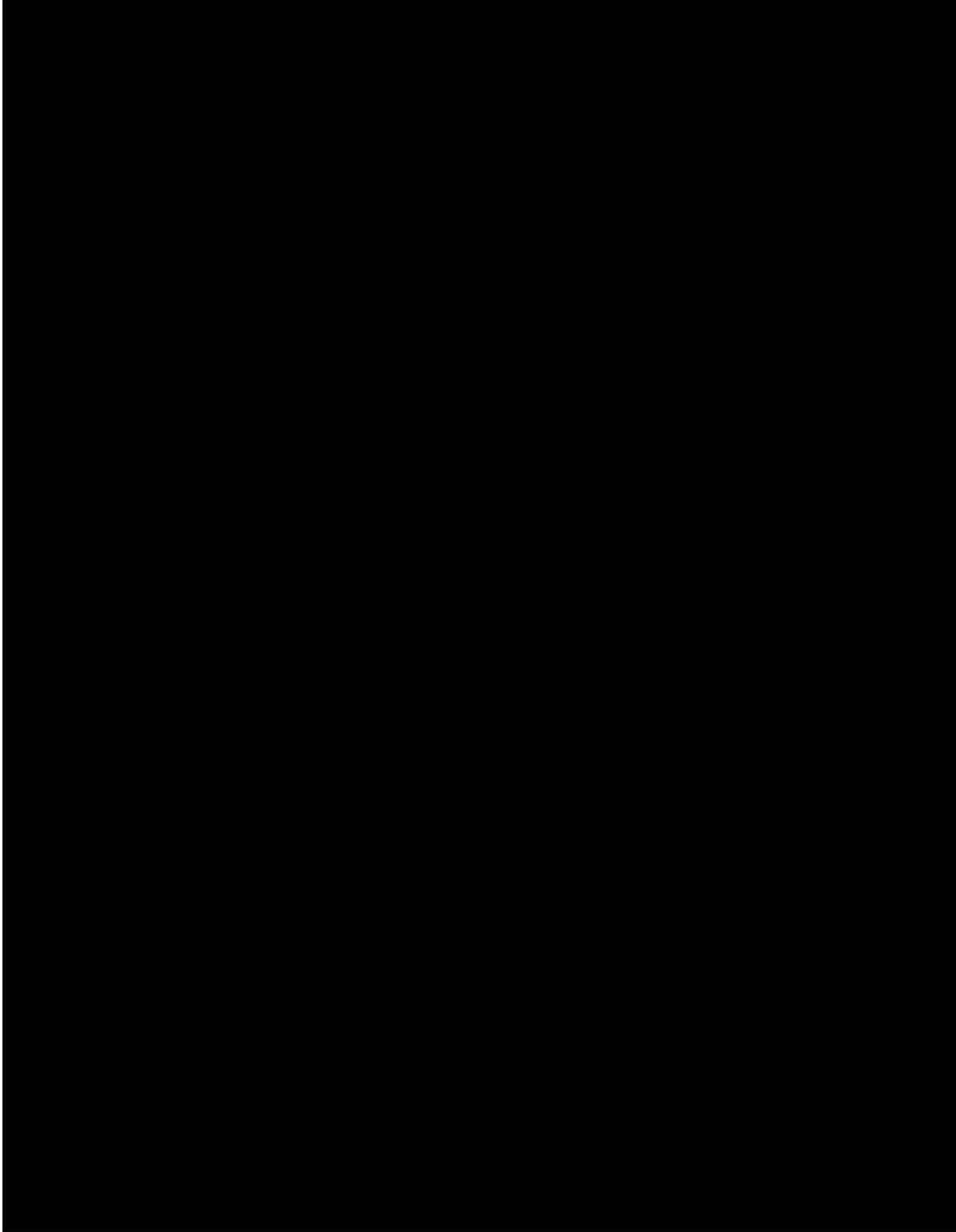
REDACTED Boston Gas Company and Colonial Gas Company
each d/b/a National Grid
D.P.U. 17-170
Attachment AG-21-39-41
Page 78 of 92



REDACTED

The Narragansett Electric Company
d/b/a National Grid
RIPUC Docket No. 4770
Attachment DIV 7-49-252
Page 79 of 92

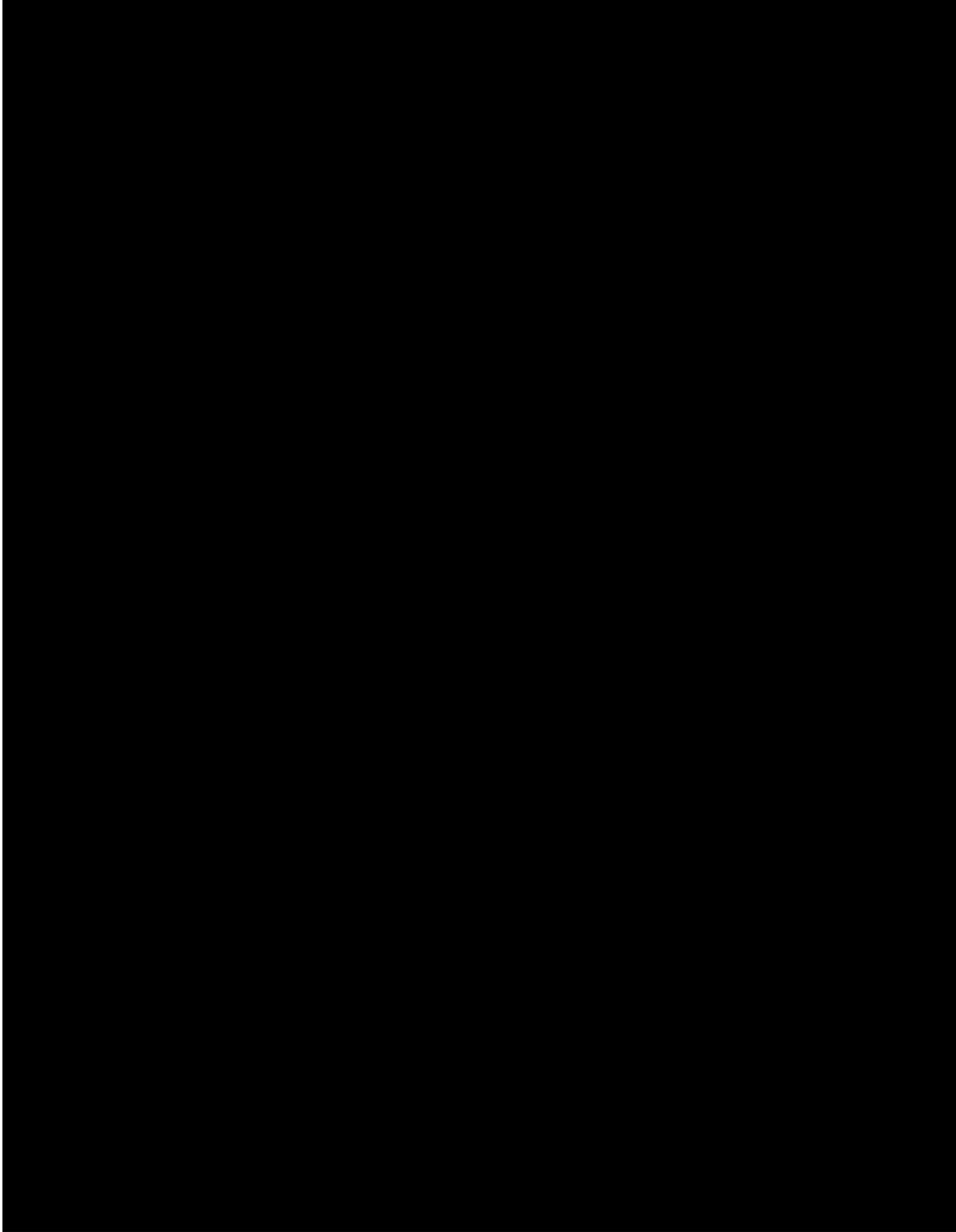
REDACTED Boston Gas Company and Colonial Gas Company
each d/b/a National Grid
D.P.U. 17-170
Attachment AG-21-39-41
Page 79 of 92



REDACTED

The Narragansett Electric Company
d/b/a National Grid
RIPUC Docket No. 4770
Attachment DIV 7-49-252
Page 80 of 92

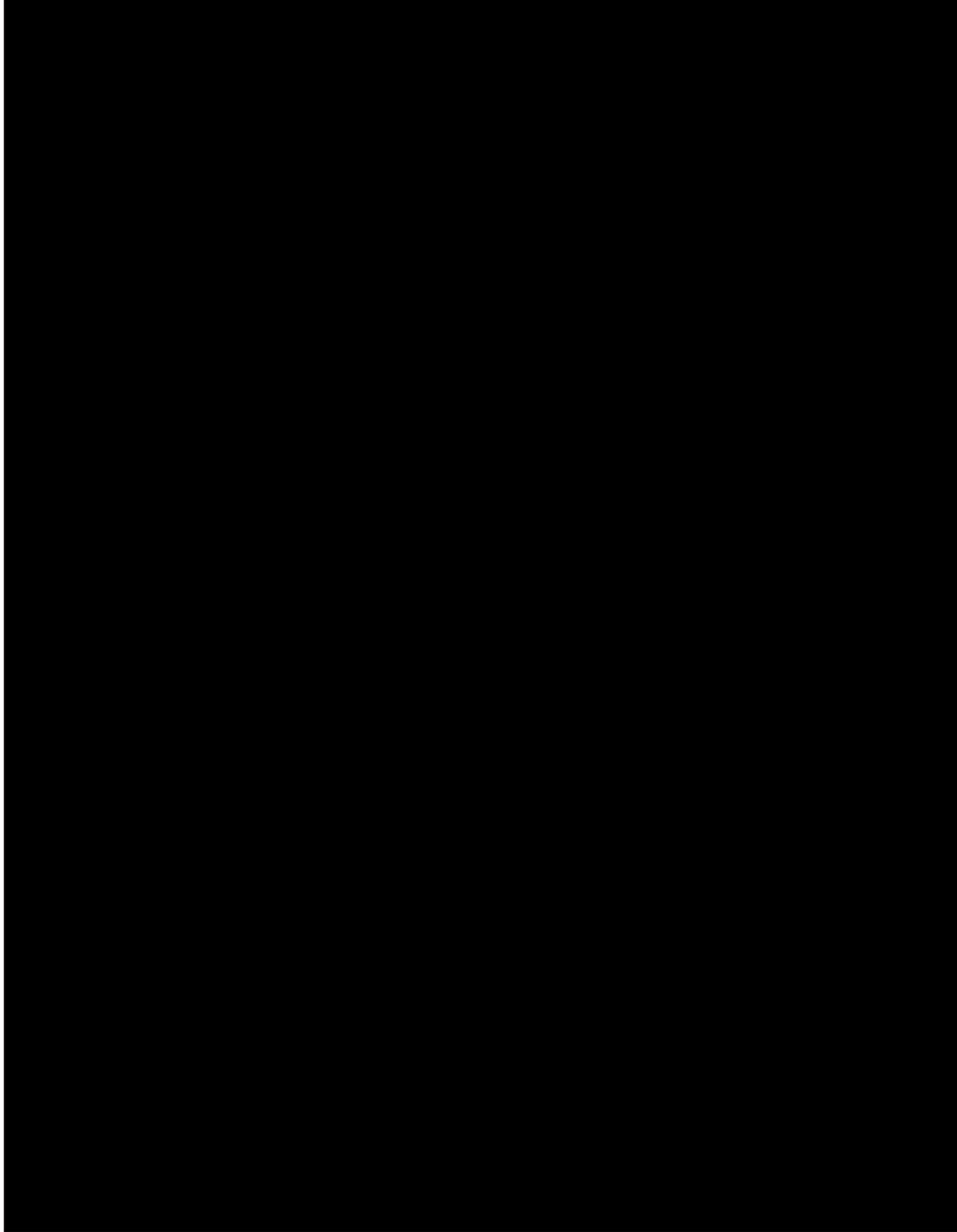
REDACTED Boston Gas Company and Colonial Gas Company
each d/b/a National Grid
D.P.U. 17-170
Attachment AG-21-39-41
Page 80 of 92



REDACTED

The Narragansett Electric Company
d/b/a National Grid
RIPUC Docket No. 4770
Attachment DIV 7-49-252
Page 81 of 92

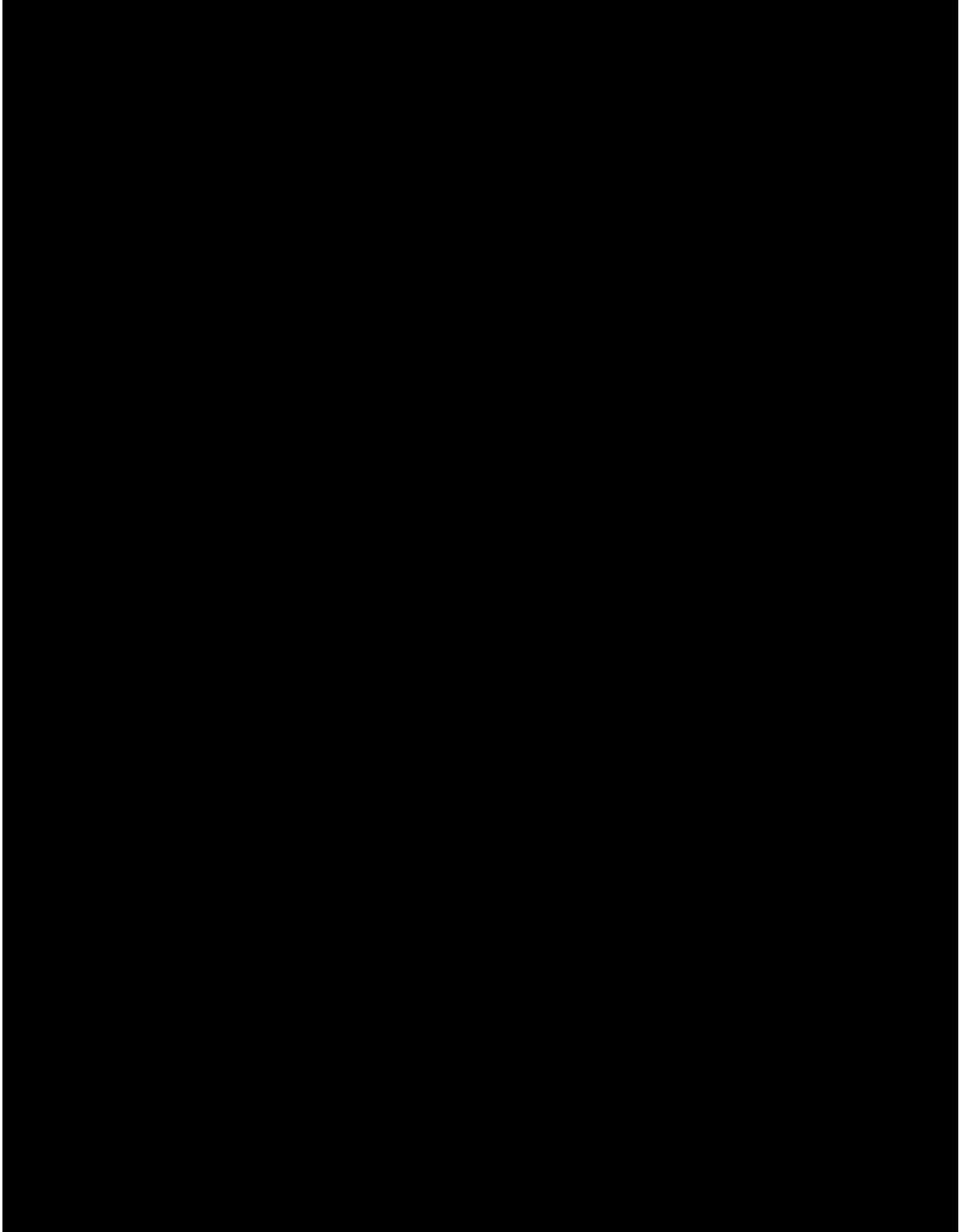
REDACTED Boston Gas Company and Colonial Gas Company
each d/b/a National Grid
D.P.U. 17-170
Attachment AG-21-39-41
Page 81 of 92



REDACTED

The Narragansett Electric Company
d/b/a National Grid
RIPUC Docket No. 4770
Attachment DIV 7-49-252
Page 82 of 92

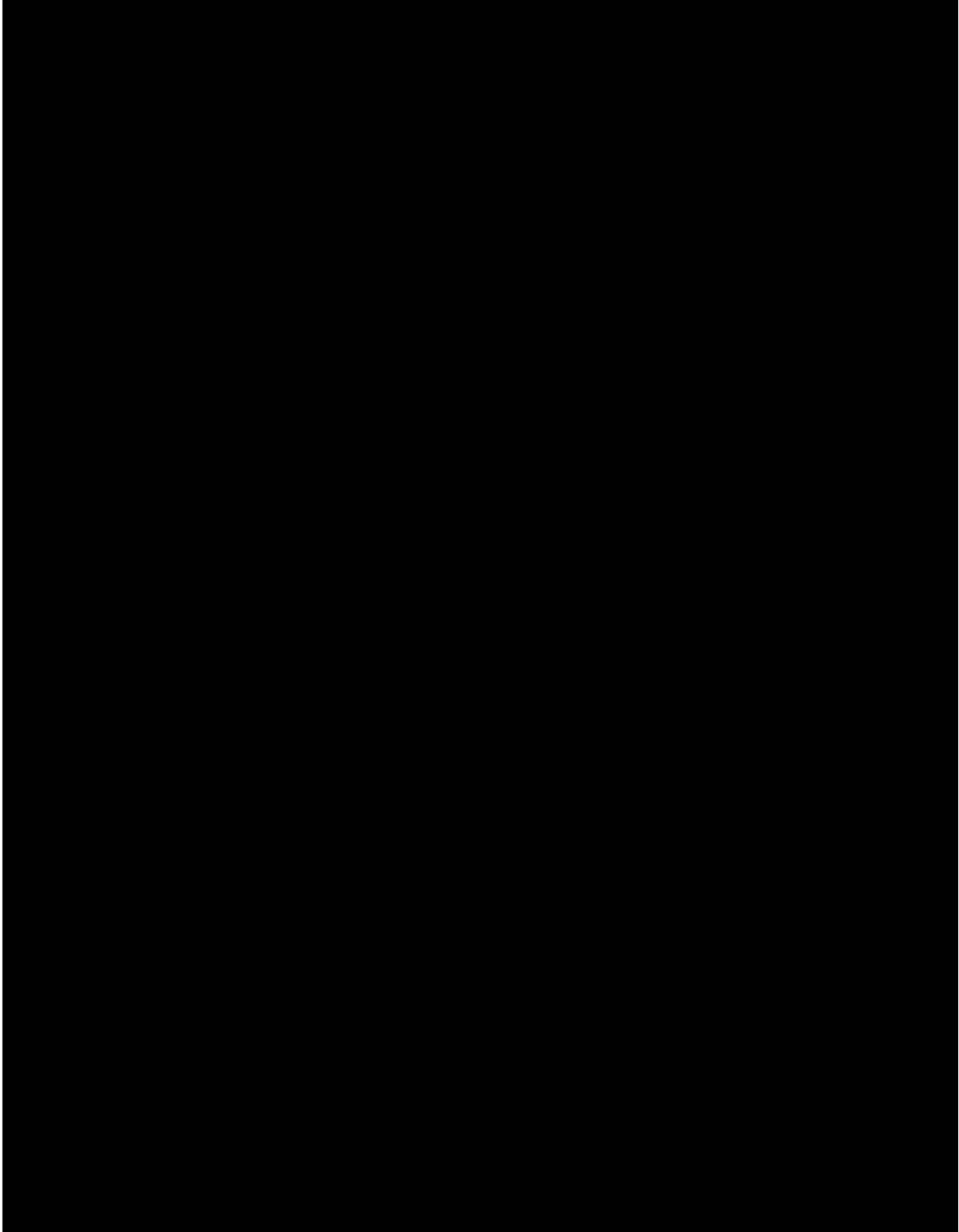
REDACTED Boston Gas Company and Colonial Gas Company
each d/b/a National Grid
D.P.U. 17-170
Attachment AG-21-39-41
Page 82 of 92



REDACTED

The Narragansett Electric Company
d/b/a National Grid
RIPUC Docket No. 4770
Attachment DIV 7-49-252
Page 83 of 92

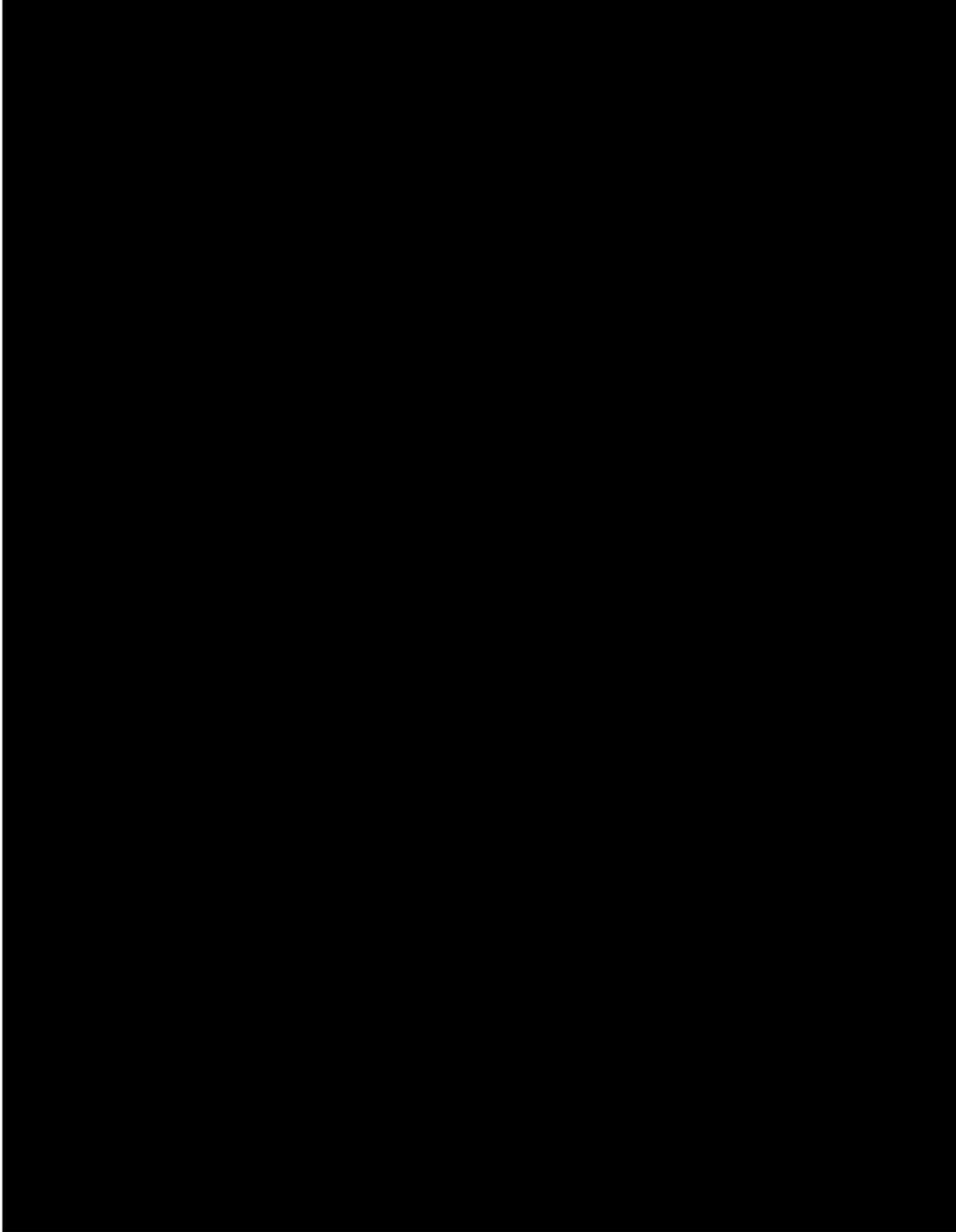
REDACTED Boston Gas Company and Colonial Gas Company
each d/b/a National Grid
D.P.U. 17-170
Attachment AG-21-39-41
Page 83 of 92



REDACTED

The Narragansett Electric Company
d/b/a National Grid
RIPUC Docket No. 4770
Attachment DIV 7-49-252
Page 84 of 92

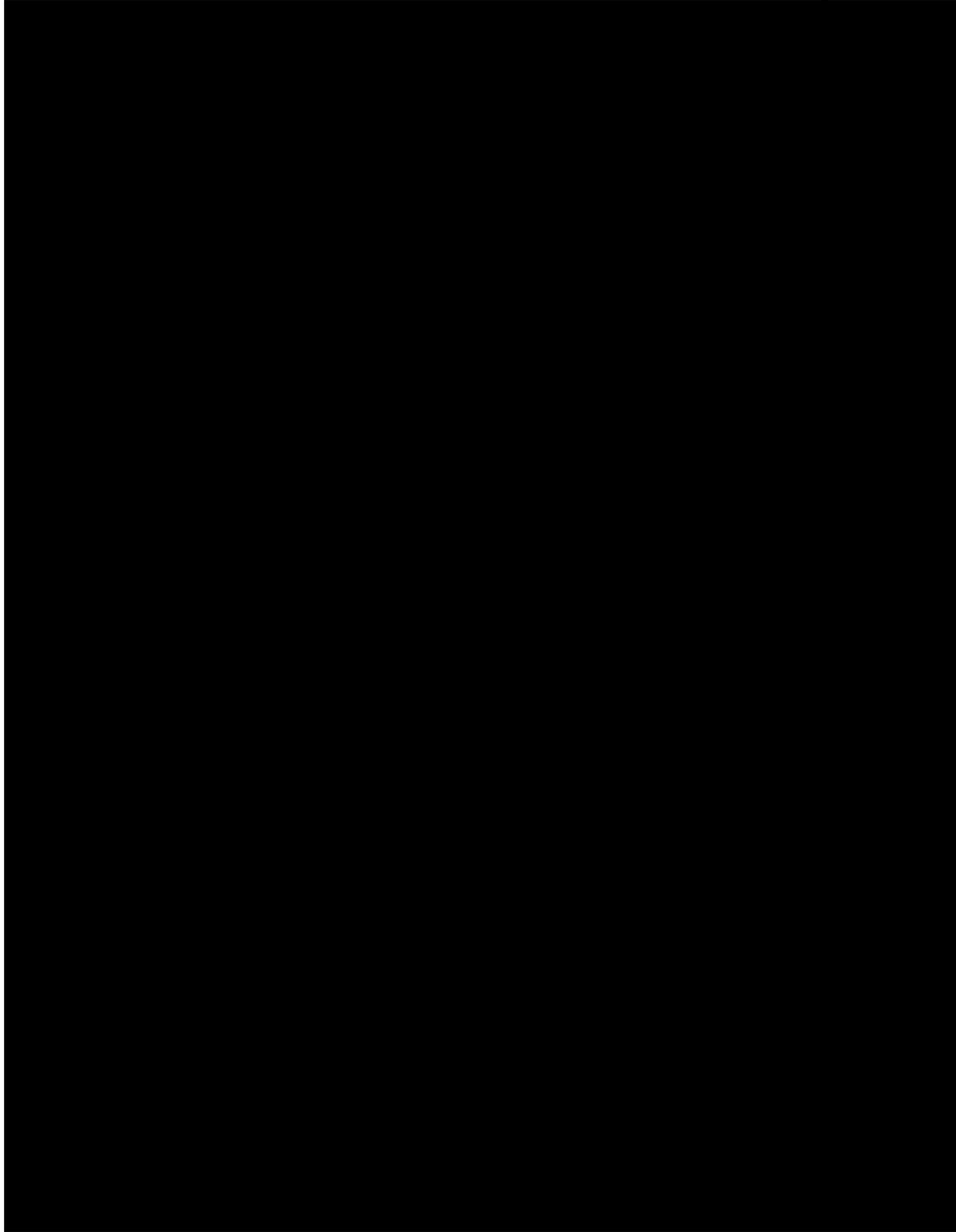
REDACTED Boston Gas Company and Colonial Gas Company
each d/b/a National Grid
D.P.U. 17-170
Attachment AG-21-39-41
Page 84 of 92



REDACTED

The Narragansett Electric Company
d/b/a National Grid
RIPUC Docket No. 4770
Attachment DIV 7-49-252
Page 85 of 92

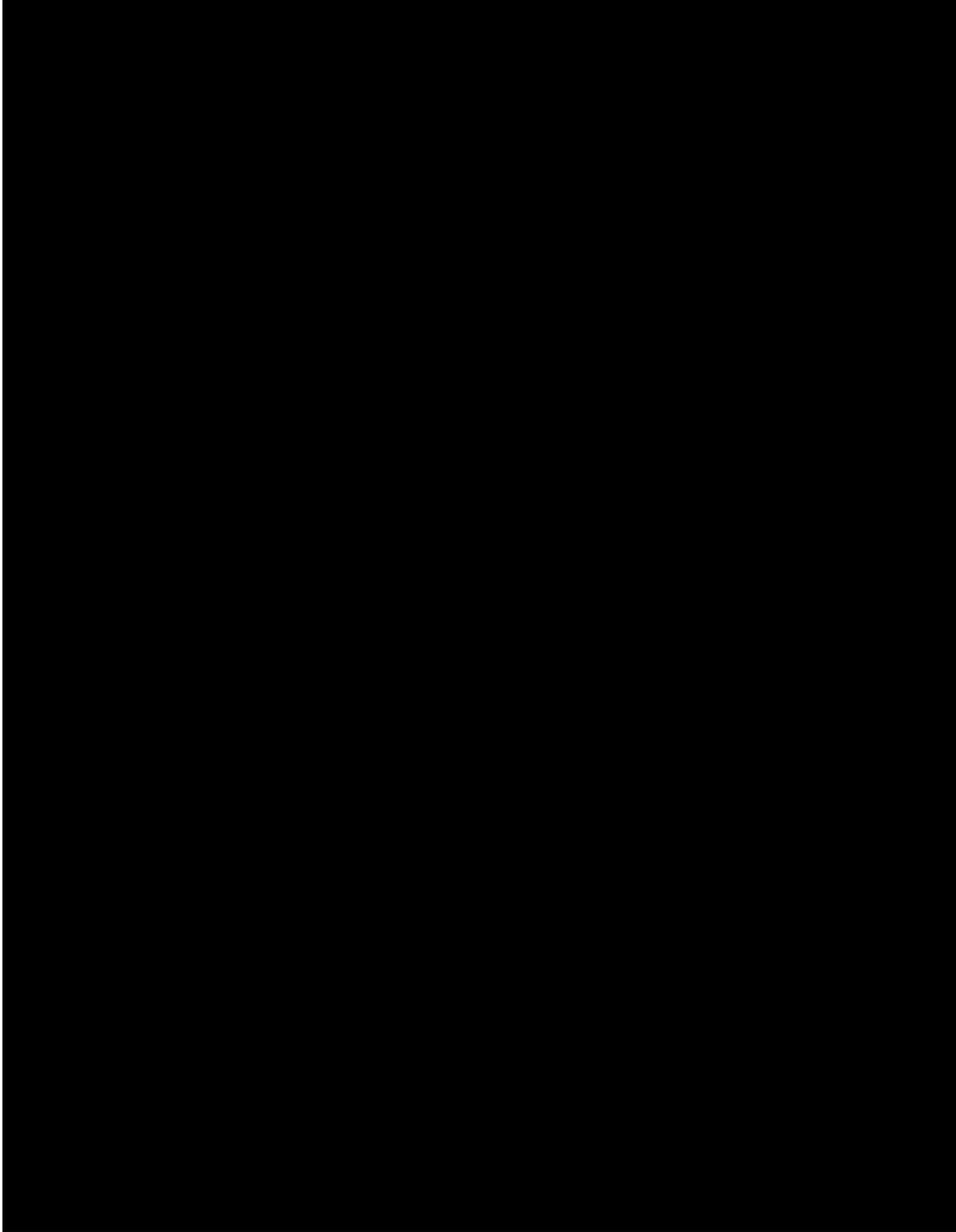
REDACTED Boston Gas Company and Colonial Gas Company
each d/b/a National Grid
D.P.U. 17-170
Attachment AG-21-39-41
Page 85 of 92



REDACTED

The Narragansett Electric Company
d/b/a National Grid
RIPUC Docket No. 4770
Attachment DIV 7-49-252
Page 86 of 92

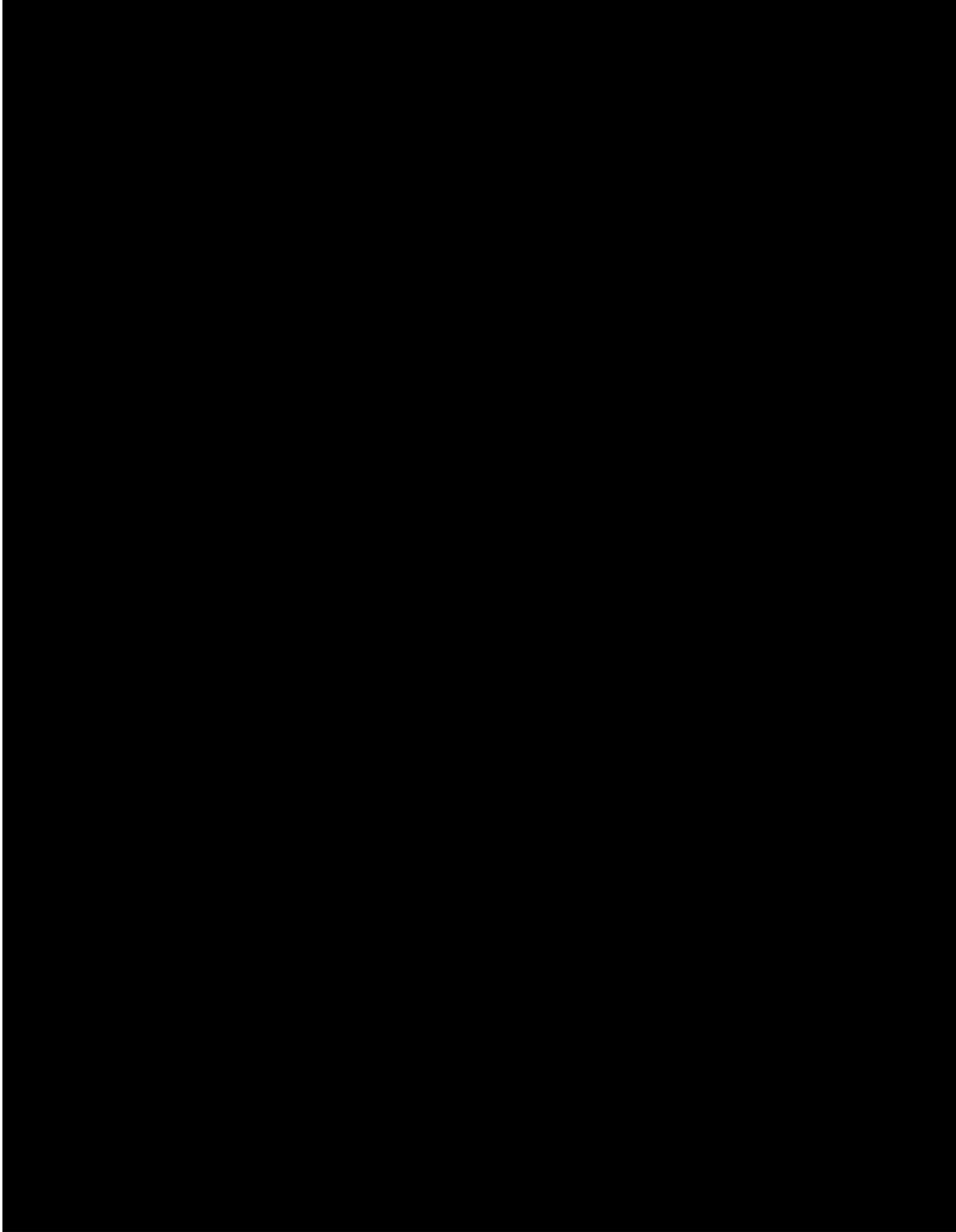
REDACTED Boston Gas Company and Colonial Gas Company
each d/b/a National Grid
D.P.U. 17-170
Attachment AG-21-39-41
Page 86 of 92



REDACTED

The Narragansett Electric Company
d/b/a National Grid
RIPUC Docket No. 4770
Attachment DIV 7-49-252
Page 87 of 92

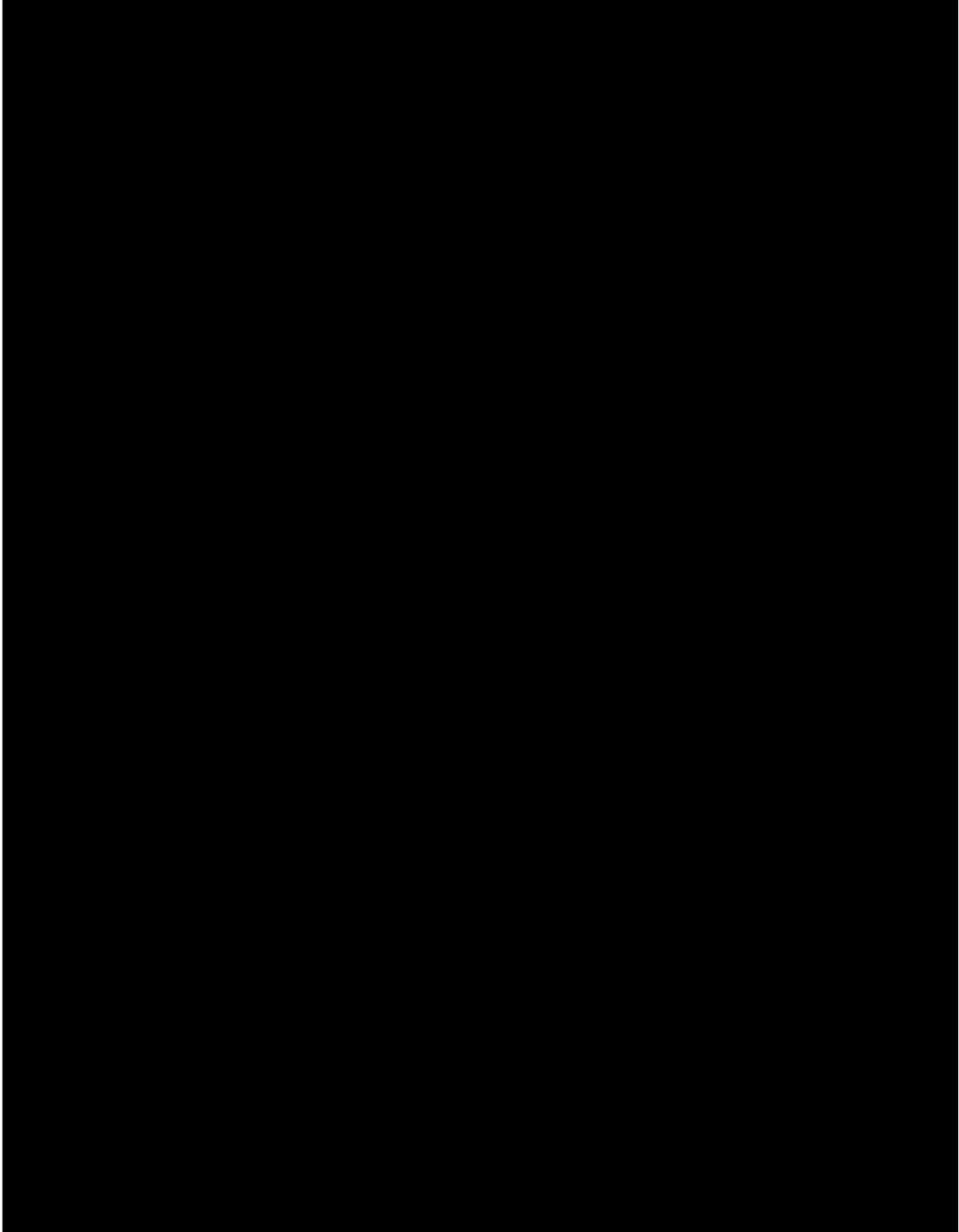
REDACTED Boston Gas Company and Colonial Gas Company
each d/b/a National Grid
D.P.U. 17-170
Attachment AG-21-39-41
Page 87 of 92



REDACTED

The Narragansett Electric Company
d/b/a National Grid
RIPUC Docket No. 4770
Attachment DIV 7-49-252
Page 88 of 92

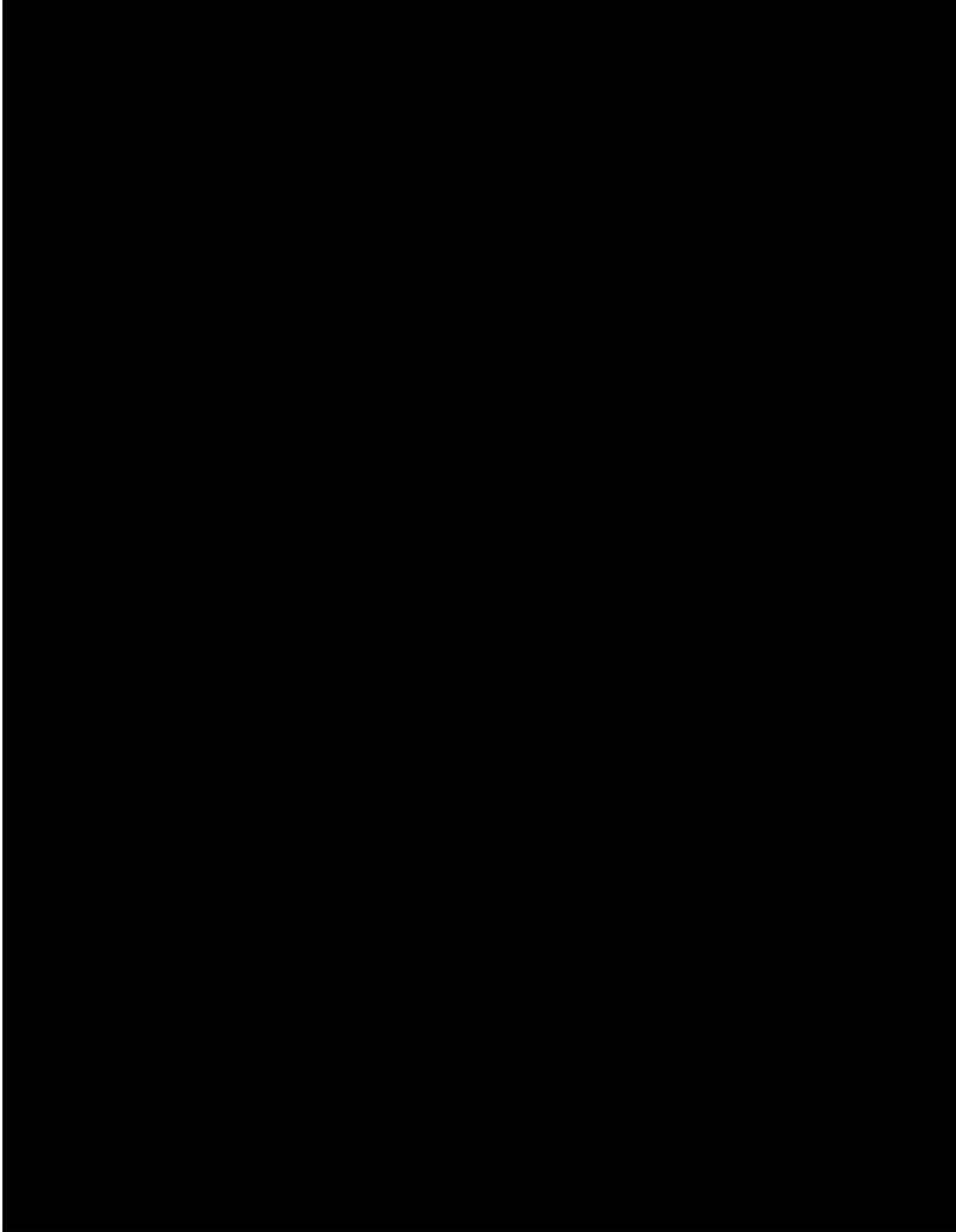
REDACTED Boston Gas Company and Colonial Gas Company
each d/b/a National Grid
D.P.U. 17-170
Attachment AG-21-39-41
Page 88 of 92



REDACTED

The Narragansett Electric Company
d/b/a National Grid
RIPUC Docket No. 4770
Attachment DIV 7-49-252
Page 89 of 92

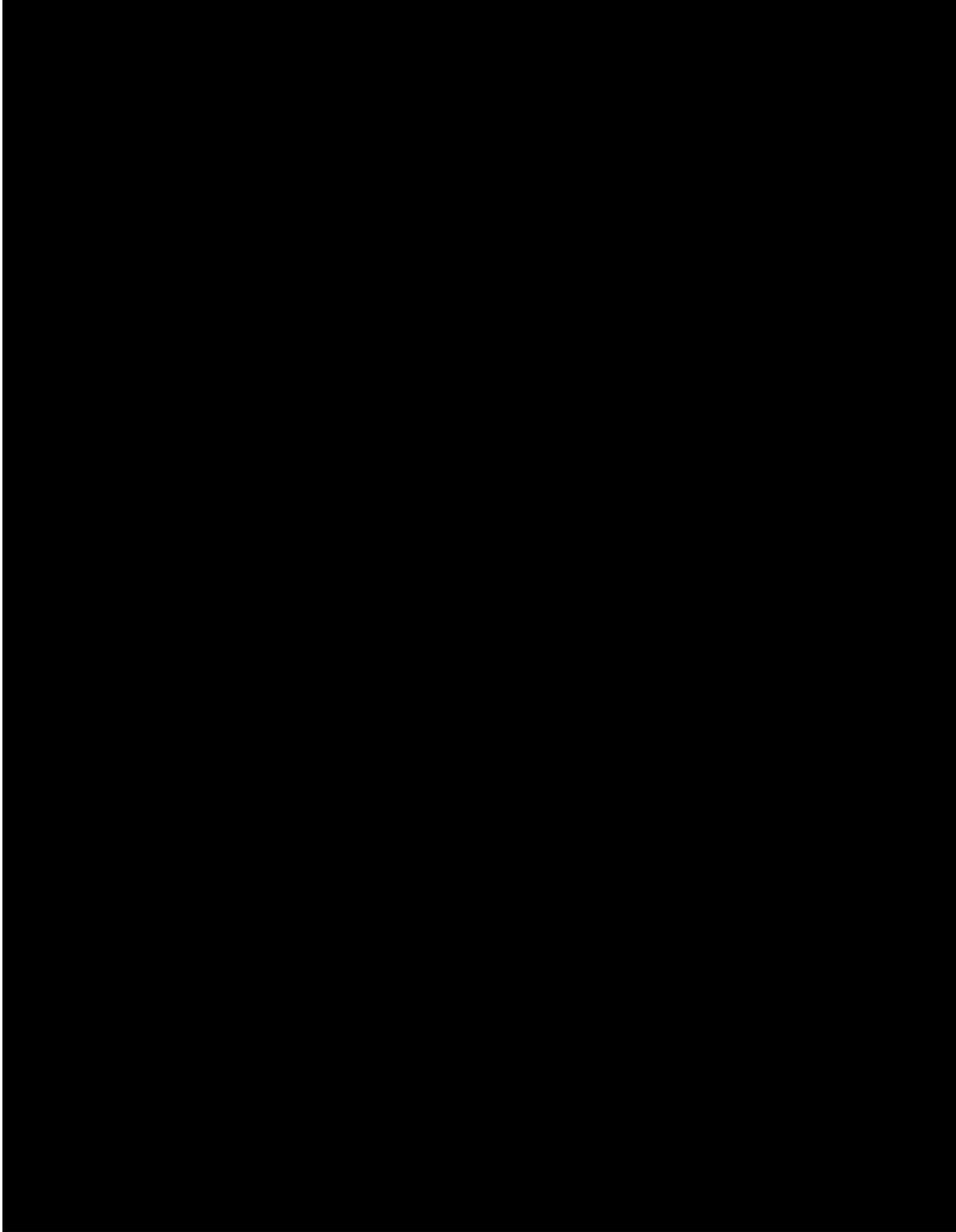
REDACTED Boston Gas Company and Colonial Gas Company
each d/b/a National Grid
D.P.U. 17-170
Attachment AG-21-39-41
Page 89 of 92



REDACTED

The Narragansett Electric Company
d/b/a National Grid
RIPUC Docket No. 4770
Attachment DIV 7-49-252
Page 90 of 92

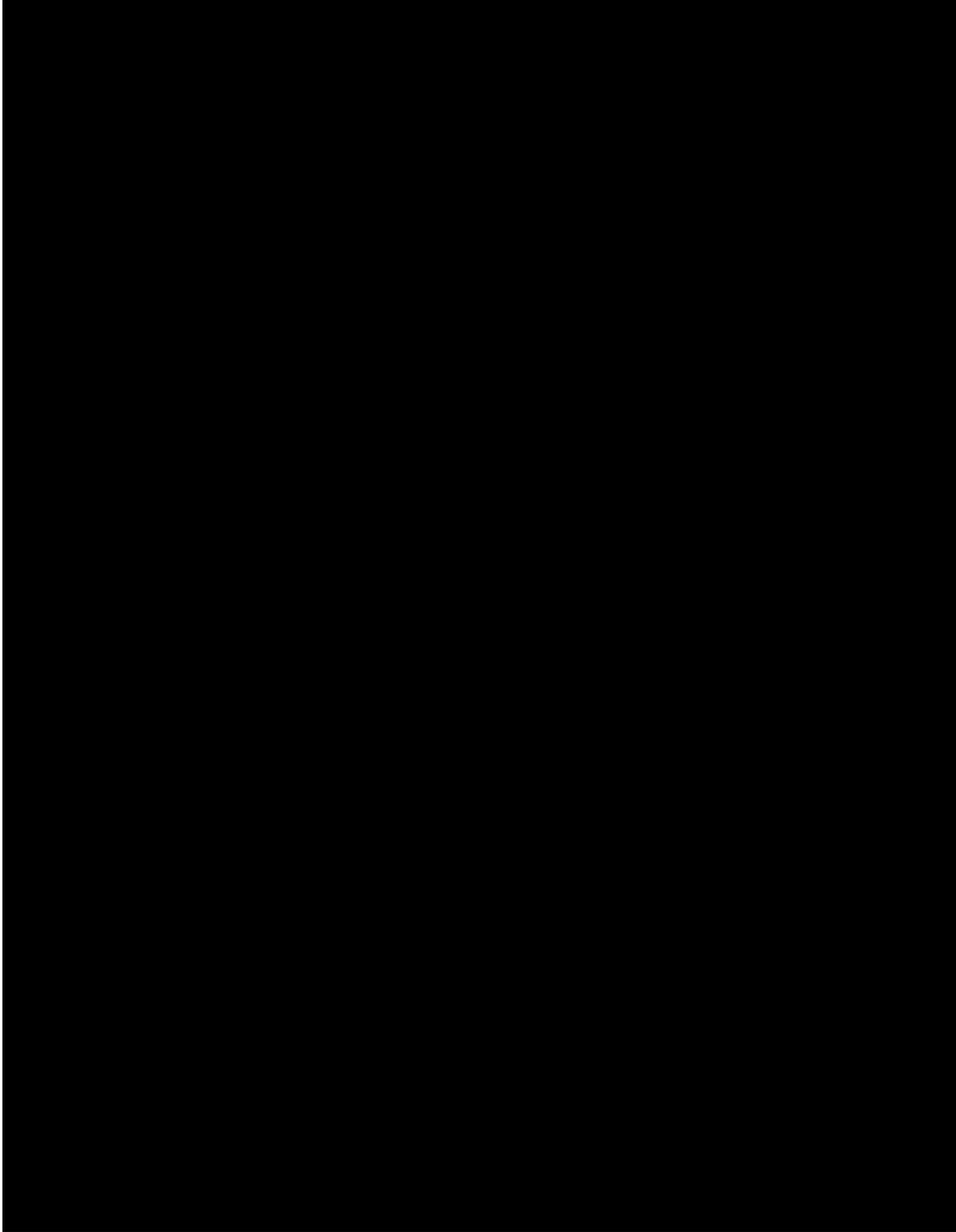
REDACTED Boston Gas Company and Colonial Gas Company
each d/b/a National Grid
D.P.U. 17-170
Attachment AG-21-39-41
Page 90 of 92



REDACTED

The Narragansett Electric Company
d/b/a National Grid
RIPUC Docket No. 4770
Attachment DIV 7-49-252
Page 91 of 92

REDACTED Boston Gas Company and Colonial Gas Company
each d/b/a National Grid
D.P.U. 17-170
Attachment AG-21-39-41
Page 91 of 92

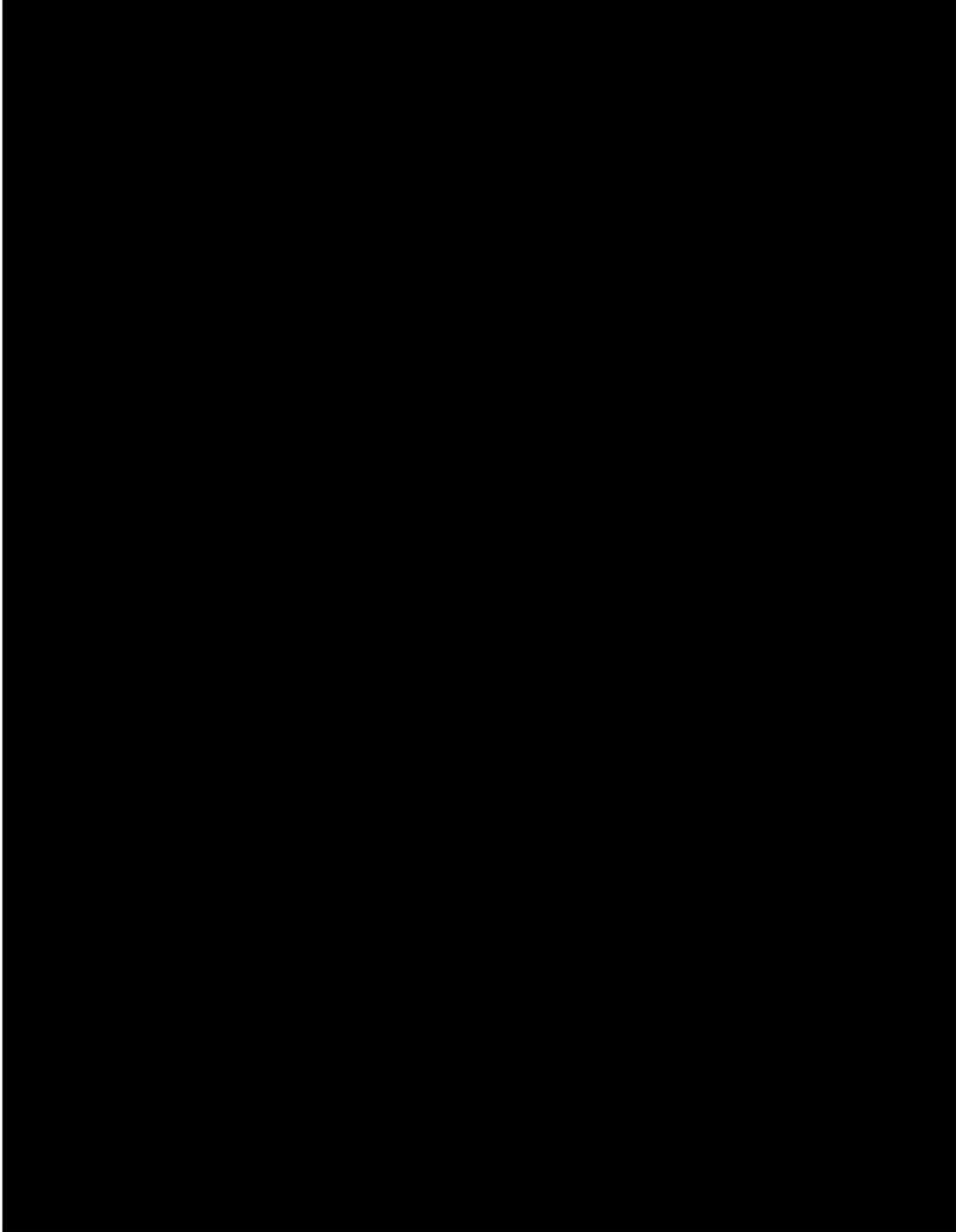


REDACTED

The Narragansett Electric Company
d/b/a National Grid
RIPUC Docket No. 4770
Attachment DIV 7-49-252
Page 92 of 92

REDACTED

Boston Gas Company and Colonial Gas Company
each d/b/a National Grid
D.P.U. 17-170
Attachment AG-21-39-41
Page 92 of 92



REDACTED

Boston Gas Company and Colonial Gas Company
each d/b/a National Grid
D.P.U. 17-170
Attachment AG-21-39-42
Page 1 of 11



NG – Gas Business Enablement

MAPPING DOCUMENT TO:



REDACTED

Boston Gas Company and Colonial Gas Company
each d/b/a National Grid
D.P.U. 17-170
Attachment AG-21-39-42
Page 2 of 11

NG has identified questions to be addressed [REDACTED]



GAS BUSINESS ENABLEMENT

DRAFT / CONFIDENTIAL

Clarifying Questions for Written Submission – [REDACTED] (1/4)

Modules	Questions
[REDACTED]	[REDACTED]

Modules	Questions
[REDACTED]	[REDACTED]

Where to find response in module proposals

1. Overall – Governance, each module doc, GIS – Section 3: pages 11-12
2. Overall – Executive Summary, each module doc, GIS – Section 4: pages 24 - 25
3. GIS – Section 4: pages 24 - 25, AM – pages 13-14, SC – page 14
4. Overall – Executive Summary, GIS – Section 4: pages 24 - 25
5. GIS – Section 4: pages 25 - 27
6. GIS – Section 6: page 44
7. ISE – Section: 13.1

8. [REDACTED]

REDACTED

Boston Gas Company and Colonial Gas Company
each d/b/a National Grid
D.P.U. 17-170
Attachment AG-21-39-42
Page 3 of 11

NG has identified questions to be addressed [REDACTED]

nationalgrid
GAS BUSINESS ENABLEMENT

DRAFT / CONFIDENTIAL

Clarifying Questions for Written Submission – [REDACTED] (2/4)

Modules	Questions
[REDACTED]	[REDACTED]

Modules	Questions
[REDACTED]	[REDACTED]

Where to find response in module proposals

1. [REDACTED]
2. Overall, WM
3. WM
4. [REDACTED]
5. ISE – Section 13.2
6. Overall
7. Overall
8. Overall
9. AM – page 34
10. Overall

REDACTED

Boston Gas Company and Colonial Gas Company
each d/b/a National Grid
D.P.U. 17-170
Attachment AG-21-39-42
Page 4 of 11

NG has identified questions to be addressed [REDACTED]



GAS BUSINESS ENABLEMENT

DRAFT / CONFIDENTIAL

Clarifying Questions for Written Submission – [REDACTED] (3/4)

Modules	Questions
[REDACTED]	[REDACTED]

Where to find response in module proposals

- 1. Overall
- 2. Overall
- 1. PO – pages 6 - 10
- 2. PO – pages 6 - 10
- 3. PO – pages 6 - 10
- 4. Pricebook – Tab 4, PO – Section 2: pages 7 - 12
- 4a. PO – Section 2: pages 9 - 10
- 1. BECM – pages 9, 18-20

REDACTED

Boston Gas Company and Colonial Gas Company
each d/b/a National Grid
D.P.U. 17-170
Attachment AG-21-39-42
Page 5 of 11

NG has identified questions to be addressed [REDACTED]



GAS BUSINESS ENABLEMENT

DRAFT / CONFIDENTIAL

Clarifying Questions for Written Submission – [REDACTED] (4/4)

Modules	Questions
[REDACTED]	[REDACTED]

Where to find response in module proposals

1. Overall

2. Overall

REDACTED

Boston Gas Company and Colonial Gas Company
each d/b/a National Grid
D.P.U. 17-170
Attachment AG-21-39-42
Page 6 of 11

NG has identified questions to be addressed [REDACTED]

nationalgrid
GAS BUSINESS ENABLEMENT

DRAFT / CONFIDENTIAL

Clarifying Questions for Written Submission – [REDACTED] (1/2)

Modules	Questions
[REDACTED]	[REDACTED]

Where to find response in module proposals

- 1. GIS – Section 4: pages 25-27
 - 2. GIS – Section 7: page 50
 - 3. GIS – Section 4: pages 22 - 23
 - 4. GIS – Section 9: pages 61 - 63
 - 5. GIS – Section 3: pages 17 – 19, Section 8: page 55, AM – page 35
 - 6. GIS – Section 6: page 44
-
- 1. CE - Section 3: pages 11-12
 - 2. CE - Section 3: pages 11-12
 - 3. CE - Section 13: page 69
 - 4. CE - Section 7: pages 39-40
 - 5. CE - Section 7: page 38
 - 6. CE - Section 11: page 61

REDACTED

Boston Gas Company and Colonial Gas Company
each d/b/a National Grid
D.P.U. 17-170
Attachment AG-21-39-42
Page 7 of 11

NG has identified questions to be addressed [REDACTED]



GAS BUSINESS ENABLEMENT

DRAFT / CONFIDENTIAL

Clarifying Questions for Written Submission – [REDACTED] (2/2)

Modules	Questions
[REDACTED]	[REDACTED]

Modules	Questions
[REDACTED]	[REDACTED]

Where to find response in module proposals

1. WM - Section 13.3: page 95

1a. WM - Section 13.4: page 97

2. WM - Section 13.5: page 99

3. WM - Section 13.6: page 15

4. WM - Section 3: page 13

5. See Overview Document, Section 10.3

6. WM - Section 13.7: page 100

7. [REDACTED]

8. WM - Section 11.13: page 72

8a. WM - Section 13.8: page 78

9. WM - Section 4: page 21

10. WM - Section 13.9: page 106

REDACTED

Boston Gas Company and Colonial Gas Company
each d/b/a National Grid
D.P.U. 17-170
Attachment AG-21-39-42
Page 8 of 11

NG has identified questions to be addressed [REDACTED]



GAS BUSINESS ENABLEMENT

DRAFT / CONFIDENTIAL

Clarifying Questions for Written Submission – [REDACTED]

Modules	Questions
[REDACTED]	[REDACTED]

Where to find response in module proposals

1. DM - Section 13: page 57
2. DM - Section 13: page 63
3. DM - Section 13: page 63
4. DM - Section 13: page 64
5. DM - Section 13: page 64
6. DM - Section 13: page 65
7. DM - Section 13: page 65
8. DM - Section 13: page 65
9. DM - Section 13: page 66



REDACTED

Boston Gas Company and Colonial Gas Company
each d/b/a National Grid
D.P.U. 17-170
Attachment AG-21-39-42
Page 9 of 11

NG has identified questions to be addressed [REDACTED]



GAS BUSINESS ENABLEMENT

DRAFT / CONFIDENTIAL

Clarifying Questions for Written Submission – [REDACTED] (1/2)

Modules	Questions
[REDACTED]	[REDACTED]

Modules	Questions
[REDACTED]	[REDACTED]

Where to find response in module proposals

1. OM – Section 2: page 6
2. OM – Section 11.7: page 35
3. OM – Section 3: page 14, Section 11.2: page 34
4. OM – Section 2: pages 10 - 11
5. OM – Section 11.3: page 38
6. OM – Section 11.12: page 37
7. OM Section 2: page 12

REDACTED

Boston Gas Company and Colonial Gas Company
each d/b/a National Grid
D.P.U. 17-170
Attachment AG-21-39-42
Page 10 of 11

NG has identified questions to be addressed [REDACTED]

nationalgrid
GAS BUSINESS ENABLEMENT

DRAFT / CONFIDENTIAL

Clarifying Questions for Written Submission – [REDACTED] (2/2)

Modules	Questions	Where to find response in module proposals
[REDACTED]	[REDACTED]	1. OM – Section 2: pages 8 - 9
[REDACTED]	[REDACTED]	2. BECM – pages 9, 18 - 20
[REDACTED]	[REDACTED]	3. BECM – pages 11, 31
[REDACTED]	[REDACTED]	4. BECM – pages 28, 31, 38
[REDACTED]	[REDACTED]	5. BECM – pages 9, 38, 41
[REDACTED]	[REDACTED]	6. BECM – pages 6, 28
[REDACTED]	[REDACTED]	7. BECM – page 8
[REDACTED]	[REDACTED]	8. BECM – page 28

REDACTED

Boston Gas Company and Colonial Gas Company
each d/b/a National Grid
D.P.U. 17-170
Attachment AG-21-39-42
Page 11 of 11

NG has identified questions to be addressed [REDACTED]

nationalgrid
GAS BUSINESS ENABLEMENT

DRAFT / CONFIDENTIAL

Clarifying Questions for Written Submission – [REDACTED]

Modules	Questions
[REDACTED]	[REDACTED]

Modules	Questions
[REDACTED]	[REDACTED]

Where to find response in module proposals

[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
2. ISE – Section 13.7
3. ISE – Section 13.8
4. CE – Section 13.13
5. ISE – Section 13.11
6. ISE – Section 13.10
7. [REDACTED]
7a. ISE – Section 3: [REDACTED]
7b. ISE – Section 13.12
8. CE – Section 7
9. ISE – Section 13.14
10. [REDACTED]

VOLUME 6, PAGES 390-677

COMMONWEALTH OF MASSACHUSETTS
DEPARTMENT OF PUBLIC UTILITIES
DPU 17-170

EVIDENTIARY HEARING, held at the
Department of Public Utilities, One South Station,
Boston, Massachusetts, on Thursday, May 10, 2018,
commencing at 10:00 a.m., concerning:
BOSTON GAS COMPANY and COLONIAL GAS COMPANY, d/b/a
NATIONAL GRID

SITTING: Cecile M. Fraser, Commissioner
Robert Hayden, Commissioner
Carol Pieper, Hearing Officer

Rates and Revenue Requirements Division:

Paul Osborne
Jeff Hall
Emily Luksha
Tyler Wagner

-----Reporter: Alan H. Brock, RDR, CRR-----

ahb@fabreporters.com www.fabreporters.com

Farmer Arsenault Brock LLC

Boston, Massachusetts

617-728-4404

<p style="text-align: right;">391</p> <p>1 APPEARANCES:</p> <p>2</p> <p>3 Cheryl M. Kimball, Esq.</p> <p>4 Ashley Wagner, Esq.</p> <p>5 Keegan Werlin LLP</p> <p>6 265 Franklin Street</p> <p>7 Boston, Massachusetts 02110-3113</p> <p>8 617.951.1400</p> <p>9 ckimball@keeganwerlin.com</p> <p>10 awagner@keeganwerlin.com</p> <p>11 for Boston Gas Company and Colonial Gas Company,</p> <p>12 each d/b/a National Grid</p> <p>13</p> <p>14 Alexandra E. Blackmore, Esq.</p> <p>15 Andrea G. Keffe, Esq.</p> <p>16 National Grid</p> <p>17 40 Sylvan Road</p> <p>18 Waltham, Massachusetts 02451</p> <p>19 781.907.2123</p> <p>20 alexandra.blackmore@nationalgrid.com</p> <p>21 andrea.keffe@nationalgrid.com</p> <p>22 for Boston Gas Company and Colonial Gas Company,</p> <p>23 each d/b/a National Grid</p> <p>24</p>	<p style="text-align: right;">393</p> <p>1 May 10, 2018 10:00 a.m.</p> <p>2 P R O C E E D I N G S</p> <p>3 MS. PIEPER: Let's go on the record.</p> <p>4 This is the sixth day of evidentiary hearings in</p> <p>5 Docket No. DPU 17-170, petition of Boston Gas</p> <p>6 Company and Colonial Gas Company, each doing</p> <p>7 business as National Grid, pursuant to General Laws</p> <p>8 Chapter 164, Section 94, and 220 CMR 5.00 for</p> <p>9 approval of general increases in base distribution</p> <p>10 rates for gas service.</p> <p>11 My name is Carol Pieper. I'm the</p> <p>12 hearing officer. With me on the bench this morning</p> <p>13 are Commissioners Robert Hayden and Cecile Fraser;</p> <p>14 and Paul Osborne and Jeff Hall, from the Rates and</p> <p>15 Revenue Requirements Division.</p> <p>16 The Department has one procedural</p> <p>17 matter. We would ask the company if you could</p> <p>18 provide for both Boston and Colonial the revenue</p> <p>19 requirement Schedules 1 through 9 by next Wednesday,</p> <p>20 the 16th, by the beginning of hearings if possible,</p> <p>21 showing all of the changes that have been made thus</p> <p>22 far.</p> <p>23 MS. KIMBALL: Yes.</p> <p>24 MS. PIEPER: Anything else procedural?</p>
<p style="text-align: right;">392</p> <p>1 Joseph W. Rogers, Esq.</p> <p>2 Joseph F. Dorfler, Esq.</p> <p>3 Elizabeth A. Anderson, Esq.</p> <p>4 Ashley Gagnon, Esq.</p> <p>5 Timothy J. Reppucci, Esq.</p> <p>6 Assistant Attorneys General</p> <p>7 Office of Ratepayer Advocacy</p> <p>8 One Ashburton Place</p> <p>9 Boston, Massachusetts 02108</p> <p>10 617.727.2200</p> <p>11 joseph.rogers@state.ma.us</p> <p>12 joseph.dorfler@state.ma.us</p> <p>13 elizabeth.a.anderson@state.ma.us</p> <p>14 ashley.gagnon@state.ma.us</p> <p>15 timothy.reppucci@state.ma.us</p> <p>16 for the Office of the Attorney General</p> <p>17</p> <p>18 Segal Roitman, LLP</p> <p>19 Kevin C. Merritt, Esq.</p> <p>20 33 Harrison Avenue</p> <p>21 Boston, Massachusetts 02111</p> <p>22 617.742.0208</p> <p>23 kmerritt@segalroitman.com</p> <p>24 for Steelworkers Union Local 12003</p>	<p style="text-align: right;">394</p> <p>1 MS. KIMBALL: We just have one question:</p> <p>2 Monday we are scheduled to have the pricing panel,</p> <p>3 and one half of the pricing panel, Jeanne Lloyd,</p> <p>4 comes from North Carolina, so she will need to</p> <p>5 travel up -- sorry, South Carolina.</p> <p>6 So we just would like to confirm that if</p> <p>7 she travels here there's questions. So can we</p> <p>8 confirm that? Ms. Leary is local. She will be</p> <p>9 here. And Ms. Lloyd, what she is in charge of is</p> <p>10 the allocated-cost-of-service study. So she doesn't</p> <p>11 do anything else that Ms. Leary would cover.</p> <p>12 So I just wanted to confirm that we do</p> <p>13 need her for questions.</p> <p>14 MS. PIEPER: I will confer with staff on</p> <p>15 the break and let you know.</p> <p>16 MS. KIMBALL: Great. What about the</p> <p>17 AG's office?</p> <p>18 MR. ROGERS: I think we're done with</p> <p>19 rate design.</p> <p>20 MS. KIMBALL: Okay, great.</p> <p>21 MS. PIEPER: I think we are, too, but I</p> <p>22 just want to double-check.</p> <p>23 We have one procedural matter.</p> <p>24 MR. MERRITT: Just a clarification:</p>

395	<p>1 Local 12003 has filed a motion for protective 2 treatment of certain exhibits, and we wanted to 3 clarify that the exhibits, the copies of the 4 exhibits that were sent out to the service list, 5 their file names are marked confidential. They are 6 in fact the redacted versions that are intended for 7 the public record. So people shouldn't have any 8 problem viewing those. 9 MS. PIEPER: Perfect. Thank you. Any 10 other procedural matters? 11 Okay. If each witness would please 12 state your full name for the record. 13 WITNESS SMITH: Amy S. Smith. 14 WITNESS McNAMARA: Daniel F. McNamara. 15 AMY S. SMITH AND DANIEL F. McNAMARA, 16 being first duly sworn or affirmed to testify to the 17 truth, the whole truth, and nothing but the truth, 18 were examined and testified as follows: 19 MS. PIEPER: You may proceed with 20 direct. 21 MS. BLACKMORE: Thank you. 22 DIRECT EXAMINATION 23 BY MS. BLACKMORE: 24 Q. Ms. Smith, by whom are you employed and in</p>	397	<p>1 which is marked for identification as Exhibit 2 NG-AS-DM-Rebuttal-1, was this exhibit prepared by 3 you or under your direct supervision and control? 4 A. [SMITH] It was. 5 Q. Do you have any changes, corrections, 6 deletions, or additions that you wish to make to 7 your prefiled direct testimony or to your rebuttal 8 testimony at this time? 9 A. [SMITH] I do not. 10 Q. Have you also seen information requests 11 propounded by the Department, the Attorney General, 12 and other intervenors in this case? 13 A. [SMITH] I have. 14 Q. And have you sponsored any responses to a 15 number of those information requests? 16 A. [SMITH] Quite a large number of them, yes. 17 Q. Were those responses prepared by you or 18 other under your direct supervision and control? 19 A. [SMITH] They were. 20 Q. At this time do you have any changes, 21 corrections, deletions, or additions that you would 22 like to make to any of the information-request 23 responses that you have sponsored in this 24 proceeding?</p>
396	<p>1 what position? 2 A. [SMITH] I'm employed by National Grid, and 3 my position is vice president of gas investment 4 resource and rate case planning. 5 Q. How long have you held your current 6 position? 7 A. [SMITH] I've been in that position 8 approximately one year. 9 Q. Were you involved in the preparation of 10 this rate case? 11 A. [SMITH] I was. 12 Q. Did you prepare prefiled direct testimony 13 as part of the gas safety and reliability panel, 14 submitted to the Department on November 15th, 2017? 15 A. [SMITH] I did. 16 Q. With respect to your prefiled direct 17 testimony, marked for identification as Exhibit 18 NG-GSRP-1, was this exhibit prepared by you or under 19 your direct supervision and control? 20 A. [SMITH] It was. 21 Q. Did you also prepare rebuttal testimony, 22 submitted to the Department on April 20th, 2018? 23 A. [SMITH] I did. 24 Q. With respect to your rebuttal testimony,</p>	398	<p>1 A. [SMITH] I do not have any changes. 2 Q. Thank you. 3 Mr. McNamara, by whom are you employed 4 and in what position? 5 A. [McNAMARA] National Grid. I'm the current 6 vice president of pipeline safety and compliance. 7 Q. And how long have you been in your current 8 position? 9 A. [McNAMARA] Just over two years. 10 Q. Were you involved in the preparation of 11 this rate case? 12 A. [McNAMARA] Yes. 13 Q. Did you also prepare rebuttal testimony, 14 marked for identification as Exhibit 15 NG-AS-DM-Rebuttal-1? 16 A. [McNAMARA] Yes, I did. 17 Q. With respect to your rebuttal testimony, 18 was this exhibit prepared by you or under your 19 direct supervision and control? 20 A. [McNAMARA] Yes, it was. 21 Q. Do you have any changes, corrections, 22 deletions, or additions that you wish to make to 23 your rebuttal testimony at this time? 24 A. [McNAMARA] No.</p>

399	<p>1 MS. BLACKMORE: The witnesses are 2 available for cross-examination. 3 MS. PIEPER: Thank you. The union may 4 proceed. 5 CROSS-EXAMINATION 6 BY MS. DECTER: 7 Q. Good morning, Mr. McNamara. How are you? 8 A. [McNAMARA] Good morning. How are you? 9 Q. Good. I'm Nicole Horberg Decter. We've 10 met before. 11 A. [McNAMARA] Yes, we have. 12 Q. I wanted to ask you first: In describing 13 your responsibilities, on Page 1 of your testimony 14 you talk about quality assurance as one of your 15 responsibilities. 16 A. [McNAMARA] Yes. 17 Q. Has Local 12003's service territory had a 18 quality assurance program in the last several years? 19 A. [McNAMARA] Yes, they have. 20 Q. For union workers in addition to nonunion? 21 A. [McNAMARA] There has not been a quality 22 assurance person filling that role within 12003 due 23 to ongoing discussions or issues with how to fill 24 that position.</p>	401	<p>1 Q. Thank you. 2 MS. PIEPER: If you could speak up. 3 It's really hard to hear you up here. 4 MS. DECTER: I'm so sorry. I don't have 5 a microphone. I'll just speak louder. 6 Q. So turning to Page 4 of your testimony: 7 You start discussing the DigTrack program 8 technology. DigTrack was implemented in January of 9 2017; correct? 10 A. I believe that part of the testimony would 11 best be provided by Ms. Smith. 12 Q. Okay. Ms. Smith, when was the DigTrack 13 technology implemented? 14 A. [SMITH] I do not know the exact dates of 15 the implementation. 16 Q. Can you find out? 17 A. [SMITH] Yes. 18 Q. We'd like to make a record request -- or 19 actually, subject to check, would you agree that it 20 was implemented in approximately January of 2017? 21 A. [SMITH] Subject to check, sure. 22 Q. And this technology is used by both 23 in-house workers and contractors in the field; 24 correct?</p>
400	<p>1 Q. And are you talking about the -- when you 2 say "ongoing discussions," are you talking about 3 collective bargaining? 4 A. [McNAMARA] Correct. 5 Q. How long has that position been unfilled? 6 A. [McNAMARA] A couple of years. I couldn't 7 tell you exactly, but it's a number of years. 8 Q. And what is the intention of the company 9 with regard to filling a quality assurance position 10 within the Local 12003 service territory moving 11 forward? 12 A. [McNAMARA] So the company's position will 13 be to move forward with filling that position within 14 the bargaining unit as soon as we reach agreement on 15 the process to select that individual. 16 Q. Can you explain what the process safety 17 program is that you mention on Page 2? 18 A. [McNAMARA] The process safety program is 19 looking at all of our processes across the gas 20 business, looking to identify and make sure that we 21 cover any risks, provide assurance that risks are 22 covered with procedures, training, et cetera, to 23 make sure that we have, you know, improved safety on 24 a regular basis.</p>	402	<p>1 A. [SMITH] That is correct. 2 Q. What classroom training was provided to 3 field employees specifically on DigTrack? 4 A. [SMITH] I do not have knowledge of the 5 specific training provided. 6 Q. Who would? 7 A. [SMITH] We could find that information out 8 for you, if you'd like. 9 Q. I'd like to make a record request for that 10 information, please. 11 MS. PIEPER: It's to provide information 12 regarding the classroom training? 13 MS. DECTER: Let me make it very 14 specific. What we would like to know is what 15 classroom training was provided to in-house field 16 employees in the Massachusetts territory 17 specifically on the DigTrack technology. In 18 addition to that, we want to know whether the 19 training was mandatory, what groups it was mandatory 20 for; if it wasn't mandatory, how many Boston Gas and 21 Colonial Gas employees participated; the times and 22 dates that this training was provided -- 23 MS. PIEPER: This is turning into quite 24 a record request. So there's no one at the company</p>

403	<p>1 that knows the answers to these questions? 2 MS. KIMBALL: Not here today. This is 3 like a discovery question. But we'll take it as a 4 record request. 5 MS. DECTER: And we'd also like the 6 training documents to the extent there were any. 7 MS. PIEPER: I need to label it. So 8 yours is being labeled as USW; is that correct? 9 MS. DECTER: Correct, yes. 10 MS. PIEPER: We'll call it Record 11 Request USW-1. 12 (Record Request USW-1.) 13 Q. Does the company have standard operating 14 procedures on using the DigTrack system? 15 A. [SMITH] The company has extensive standard 16 operating procedures. I would need to review the 17 individual procedures to see what details may or may 18 not exist for DigTrack. So I do not know 19 specifically to the extent where DigTrack may be 20 mentioned in our operating procedures. 21 Q. I'd like to make another record request: 22 To the extent there are standard operating 23 procedures for the use of DigTrack, the union would 24 request those be provided. And I'm only asking</p>	405	<p>1 Q. Is there someone at the company who would 2 know whether training was offered? 3 A. [SMITH] We can provide you with that 4 information. It just does not fall within my area 5 of expertise. 6 Q. I understand. So we'd like to ask 7 essentially the same record request that we asked in 8 Record Request No. 1 with regard to the DigTrack 9 program but for ArcGIS. 10 MS. PIEPER: For clarity of the record, 11 can you read it so we have it in the transcript? 12 MS. DECTER: We'd like to know what 13 classroom training was provided to field employees 14 on ArcFM, whether the training was mandatory, who it 15 was mandatory for, how many Boston Gas and Colonial 16 Gas employees participated if it was not mandatory, 17 the times and dates allotted for this training, and 18 the content of training and any training documents 19 provided. 20 MS. PIEPER: That's going to be Record 21 Request USW-3. 22 (Record Request USW-3.) 23 Q. Now, going back to your testimony on Page 24 4: You say, both of you collectively say, "Field</p>
404	<p>1 specifically for the use of DigTrack, so if there 2 are just general standard operating procedures, we 3 don't care about those. You've already provided 4 them. 5 MS. PIEPER: That's going to be Record 6 Request USW-2. And you understand what she's 7 looking for? 8 WITNESS SMITH: I do. 9 MS. PIEPER: Thank you. 10 (Record Request USW-2.) 11 Q. Now, I understand that the company also 12 initiated a new mapping system for the field in or 13 around April 2017 called ArcGIS. Are you familiar 14 with that technology? 15 A. [SMITH] I have some general familiarity 16 with the mapping system. 17 Q. Subject to check, would you agree that it 18 was implemented in April of 2017? 19 A. [SMITH] Subject to check. 20 Q. And are you aware of any training that was 21 offered to employees within the Massachusetts 22 territory for the ArcGIS program? 23 A. [SMITH] I have no specific information or 24 knowledge of training that is offered.</p>	406	<p>1 locators can access data necessary to conduct 2 requested markouts of gas facilities and also of 3 load documentation for each ticket." Do you 4 remember giving that testimony? 5 A. [SMITH] I do. 6 Q. So when you talk about data necessary, 7 you're just talking about work orders; correct? 8 A. [SMITH] They're able to access work 9 orders, they're able to access the maps and records, 10 and they're able to access procedures. 11 Q. As you sit here today, you're certain that 12 they're able to access maps and records from 13 DigTrack? 14 A. [SMITH] From DigTrack specifically? No, 15 not from DigTrack. I did not understand you were 16 talking to DigTrack. I'm saying specifically and in 17 general they have the tools that they need to access 18 those records in general through different systems. 19 Q. Well, DigTrack, unlike the other electronic 20 systems available to technicians in the field, is 21 available on iPhones; correct? 22 A. [SMITH] That's correct. 23 Q. And ArcGIS, SPIPE, the other 24 technologies -- New England GIS -- those aren't</p>

407	<p>1 available on the iPhone; correct? 2 A. [SMITH] That's correct. 3 Q. So there's no mapping on the iPhone; 4 correct? 5 A. [SMITH] I would need to confirm that there 6 is no mapping available on the iPhone. My 7 understanding is that through DigTrack it is not 8 available, but I do not know if they have other 9 methods to access it through their iPhones. 10 Q. And sketches made on service cards aren't 11 available on DigTrack, either; correct? 12 A. [SMITH] I believe that's correct. 13 Q. You also state that folks in the field can 14 upload information using DigTrack regarding 15 completed projects; correct? 16 A. [SMITH] That is correct. 17 Q. But those are only text completion records; 18 correct? 19 A. [SMITH] I would need to confirm that. 20 Q. Is there someone here today whom with you 21 confirm that with? 22 A. [SMITH] There would not be, no. 23 Q. I'd like to make a record request, which 24 will be No. --</p>	409	<p>1 location to maximize efficiency. So we'd like to 2 ask a record request about whether the company 3 intends to use that portion of the DigTrack 4 application and when it intends to implement that. 5 MS. PIEPER: And it's the portion that 6 plots all work orders by location? 7 MS. DECTER: Yes, and also why it isn't 8 currently using it. 9 MS. PIEPER: That's USW-5. 10 (Record Request USW-5.) 11 Q. Moving on to Page 6 of your testimony: You 12 say that the GB technology is going to include map 13 locations for all work in street-level routing. Is 14 this the same as sketches and maps? Is it going to 15 replace the current mapping system? Can you 16 explain? 17 A. [SMITH] So we have the GB witnesses who 18 are on later today, and they would be better suited 19 to provide the specific details regarding that 20 request. 21 Q. DigTrack is inaccessible from time to time; 22 correct? 23 A. [SMITH] That's correct. 24 Q. In fact, it crashes at least once five to</p>
408	<p>1 MS. PIEPER: I will say the number. All 2 you need to do is tell me what you're asking for. 3 MS. DECTER: I'm sorry. New forum. I 4 appreciate that. 5 I'd like to make a record request to 6 answer the question of whether DigTrack allows 7 individuals in the field to upload any information 8 other than text or narrative records of the 9 completion of a ticket. 10 MS. PIEPER: That's going to be Record 11 Request USW-4. And you understand the question? 12 WITNESS McNAMARA: Yes. 13 (Record Request USW-4.) 14 Q. Does the DigTrack application have 15 functions which are not currently being utilized by 16 the company? 17 A. [SMITH] I do not know the answer to that 18 question. 19 Q. Who would know? 20 A. [SMITH] We can consult with somebody at 21 the company who works on the DigTrack system. 22 Q. So in particular, the union is interested 23 in whether the company intends to use technology on 24 the DigTrack system that plots all work orders by</p>	410	<p>1 seven days a week; correct? 2 A. [SMITH] I don't know that I would 3 specifically describe it as DigTrack crashing. What 4 typically happens is the connectivity to DigTrack at 5 times does not work. The reason for DigTrack's 6 unavailability, I don't know the specific reasons or 7 don't know whether I would characterize that as 8 crashing. 9 Q. Okay. Can you provide us with a specific 10 explanation of why DigTrack goes down with frequency 11 and find out the number of days a week DigTrack goes 12 down at least once? 13 A. [SMITH] We can provide those details to 14 you. 15 Q. We'd like to make a record request for the 16 information that I just requested. 17 MS. DECTER: Can you read that back, 18 Alan? I'm sorry. 19 MS. PIEPER: So you want a -- I'm just 20 reading what the transcript says. You want a 21 specific explanation of why DigTrack goes down with 22 frequency and find out the number of days a week 23 DigTrack goes down at least once. Is that over a -- 24 MS. DECTER: Over a weekly period.</p>

411	<p>1 MS. PIEPER: Over a weekly period. 2 MS. DECTER: Yeah, on average. 3 MS. PIEPER: So on average since its 4 inception or in the last year? 5 MS. DECTER: It started in January of 6 2017, so why don't we say a year period, April 2017 7 to the present date. 8 MS. PIEPER: And that's something that 9 you can get? That's information -- 10 WITNESS SMITH: We can get that, yes. 11 MS. PIEPER: That's going to be Record 12 Request USW-6. 13 (Record Request USW-6.) 14 Q. When you say "connectivity," are you 15 talking about access to the server? Are you talking 16 about a wifi problem? Can you explain what you mean 17 in the context of DigTrack? 18 A. [SMITH] Sure. So again, I can speak in 19 general regarding our systems, whether it applies to 20 DigTrack or to other systems. The company is aware, 21 and I believe we've responded to data requests 22 regarding some of the issues that we've had and we 23 speak to in our testimony. 24 The systems that our field technicians</p>	413	<p>1 technicians may be working in an area with poor cell 2 phone coverage, so at those times they would not be 3 able to connect to the network. 4 Q. Are there any other reasons there would be 5 a problem with connectivity and DigTrack? 6 A. [SMITH] I am not a telecommunications 7 expert or an IT expert, and so I would not know the 8 answer to that question. 9 Q. Has the company worked with the vendor of 10 DigTrack to resolve issues with the DigTrack system 11 going down since its inception on January 1, 2017 or 12 around there? 13 A. [SMITH] I would not have the specific 14 details. I am sure that the company does work with 15 the vendors of the systems when we are experiencing 16 issues with those systems. But again, I am not 17 responsible for the DigTrack system. I am not an 18 expert on the DigTrack. So I cannot answer your 19 question. 20 Q. Who would be responsible? 21 A. [SMITH] I'm sure there's somebody within 22 the company. I don't know specifically who the 23 individual is who's responsible for that. 24 Q. So we'd like to make a record request for</p>
412	<p>1 need to access through their Toughbook computers or 2 terminals that are in their vehicles are older 3 technology, and they're equipped with 3G technology 4 to access. That is no longer supported by the 5 telecommunications companies. 6 One of the initiatives that we have 7 under gas business enablement is going to be to 8 replace these with more modern equipment, including 9 iPads and iPhones that are equipped with modern 10 telecommunications technology. 11 So, you know, again, from time to time 12 you might drive through an area with no access, but 13 that should happen far less frequently because of 14 the updated telecommunications technology that the 15 new units will have. 16 Q. So as we've discussed previously, DigTrack 17 is the one technology you can get on the iPhone that 18 has been given to all field employees of the 19 company; correct? 20 A. [SMITH] That is correct. 21 Q. So what are the specific connectivity 22 issues with DigTrack, given that it's available on 23 the iPhones? 24 A. [SMITH] So, again, from time to time, the</p>	414	<p>1 the identity of the individual who is responsible 2 for addressing non-connectivity issues with the 3 workability of DigTrack with the DigTrack vendor, 4 and then all measures taken to resolve problems with 5 DigTrack since its inception. 6 MS. PIEPER: I just want to make sure I 7 heard you right, because you were asking a line of 8 questions about the connectivity issues, but then 9 your record request, you used the word 10 "non-connectivity issues." I just want to make sure 11 that I understand what you're asking. 12 MS. DECTER: Ms. Smith when she 13 testified said that connectivity issues with the 14 iPhones was very unlikely, but there's reason to 15 believe that the DigTrack system actually goes down 16 with great frequency, and DigTrack's the only 17 application that's available on the iPhones to field 18 personnel. 19 So the question would be, if there are 20 issues related not to connectivity, which she was 21 not aware of what those issues would be -- 22 reasonably; it's not her job -- you know, whether 23 the -- you know, what those issues are and how has 24 the company dealt with them with the vendor.</p>

415	<p>1 MS. PIEPER: I just want to confirm -- I 2 hear what you're saying, because I'm reading it. So 3 your record request is for the identity of the 4 individual who is responsible for addressing 5 non-connectivity issues. 6 MS. DECTER: Non-connectivity. 7 MS. PIEPER: With the workability of 8 DigTrack for the DigTrack vendor and all measures 9 taken to resolve problems with DigTrack since its 10 inception. That is Record Request USW-7. 11 (Record Request USW-7.) 12 Q. Are you aware -- strike that. There were 13 responses in discovery -- I believe in response to 14 USW-4-41 -- that you provide, Ms. Smith -- 15 I'm sorry; I'm quoting the wrong one. 16 Let me ask you in a different way. 17 In testimony on Page 5 you said that 18 there were certain connectivity issues with 19 Toughbooks. Correct? 20 A. [SMITH] Correct. 21 Q. When you say that, what you're saying is 22 that individuals aren't able to access information 23 on their computers because the wifi isn't working. 24 Correct?</p>	417	<p>1 Q. Now, you're aware that there are frequent 2 complaints about connectivity in the vans; correct? 3 A. [SMITH] I am aware, yes. 4 Q. And it's fair to say that the computers 5 fail with great frequency; correct? 6 A. [SMITH] The computers are, as we 7 explained, older technology that are equipped with 8 the 3G wireless technology, which is not supported 9 by the telecommunications vendors. So the inability 10 to access the system or the inability for the wifi 11 to work does occur on, you know -- it occurs on a 12 periodic basis. 13 Q. How long has the 3G system been unsupported 14 by the telecommunications vendors? 15 A. [SMITH] I do not know the exact answer to 16 that. 17 Q. We'd like to make a record request for the 18 date, approximate date, upon which the 3G network, 19 by which all the -- on which all the Toughbooks, all 20 the van computers run became unsupported by the 21 telecommunications vendors? 22 MS. KIMBALL: I'm just going to object 23 to this. I don't actually think that there's 24 probably like a specific point that we're going to</p>
416	<p>1 A. [SMITH] That is correct. 2 Q. Does the company keep records of how long 3 individual field reps go without connectivity to 4 their in-van computers? 5 A. [SMITH] So the company would have records 6 of when the issues are occurring. I would need to 7 confirm whether or not the company captures 8 information on the length of the outages. I believe 9 we can confirm how many. I do not know if we can 10 confirm the time lapse between.... 11 Q. So we would like to make a record request, 12 and we can make it just for the test year, 2017, and 13 2018, on -- 14 Do you use the term "blackouts"? Is 15 that what you were saying? 16 A. [SMITH] Outages. 17 Q. -- on the number of connectivity outages in 18 field vehicles in the Massachusetts territory, and 19 if the company keeps this data, the amount of time 20 between the outage and the reinstatement of service. 21 A. [SMITH] I understand. 22 MS. PIEPER: That's going to be Record 23 Request USW-8. 24 (Record Request USW-8.)</p>	418	<p>1 be able to identify, and I just don't see the point 2 of spending a whole bunch of time trying to pin 3 something down like that. We're being very flexible 4 here, but that's not going to be information that's 5 going to be tied to a specific date. 6 MS. DECTER: I'm happy to make it an 7 approximate date. I'm quite certain that there was 8 a date that telecommunications vendors announced 9 that they would no longer support the 3G network to 10 the company, and that certainly we're not expecting 11 a pinpoint of a specific day. But it doesn't seem 12 like it's a reasonable thing for a large customer 13 like National Grid to be able to tell when the 3G 14 network became unsupported. 15 MS. KIMBALL: I don't think that those 16 kinds of things are announced. I'm just saying this 17 is a piece of information that's a wild goose chase 18 for the company. 19 MS. PIEPER: I have to agree. It seems 20 like it's the kind of information that is a Google 21 search, that we could all use our Google and figure 22 out when 3G changed. 23 MR. ROGERS: My phone can get 3G now. I 24 don't understand why it's not supported.</p>

419	<p>1 MS. DECTER: It seems like, given that 2 this is a statement that the company is making 3 relative to why the computers in their vans don't 4 work, it would be upon them to know when that 5 started and is obviously relevant to their GBE 6 proposal. They're saying they need to modernize 7 their computer systems and their technology to meet 8 the current technology that's available and that the 9 3G network is no longer supported and that it leads 10 to the absence of information in the field for their 11 field techs. So it seems like they should know when 12 the equipment that they are using became 13 unsupported. That actually doesn't seem -- 14 MS. PIEPER: Okay, so I will allow it. 15 And you're looking for the approximate date that the 16 3G network became unsupported by telecom vendors. 17 MS. DECTER: Thank you. 18 MS. PIEPER: That's Record Request 19 USW-9. 20 (Record Request USW-9.) 21 Q. When workers can't access their Toughbooks, 22 it becomes harder for them to do their jobs, 23 particularly if they're trying to locate pipe in the 24 ground; correct?</p>	421	<p>1 you to clarify what you mean, the definition of 2 "field construction." 3 Q. I think we're talking about the CMS 4 department. 5 A. [McNAMARA] CMS department. I'm sorry, 6 repeat the question. 7 Q. In the CMS department how many field 8 personnel are there to each supervisor? 9 A. [McNAMARA] As Ms. Smith had stated, it 10 varies yard to yard, based on different areas of the 11 company. But in general, my understanding is we try 12 to keep the ratio no more than a supervisor between 13 15 and 20 people. 14 Q. What about in damage prevention? 15 A. [McNAMARA] I am not familiar with the 16 number of supervisors and/or the number of 17 technicians to determine the span of control. 18 Q. Who would be? 19 A. [SMITH] We can check with -- 20 A. [McNAMARA] Department manager. 21 MS. PIEPER: And that's nothing that 22 would have been asked already through an information 23 request? 24 WITNESS SMITH: I know there were some</p>
420	<p>1 A. [SMITH] So when the workers are unable to 2 access their information through Toughbooks, they 3 have all been trained on what they need to do to get 4 that information. So specifically, yes, it would 5 not be readily available to them, but they have all 6 been trained and instructed to contact their 7 supervisors, let them know that they're having 8 issues with connectivity, and that the information 9 they needed will be brought to them in the field. 10 Q. How many field personnel or field crews -- 11 or locating -- how many locating crews -- strike 12 that. Let me make it simpler. 13 How many field personnel does each 14 supervisor at the company in Massachusetts territory 15 supervise? 16 A. [SMITH] That number is going to vary from 17 area to area, in terms of what the spans -- the 18 number will vary from area to area. 19 Q. In field construction, how many supervisors 20 are there, approximately, to -- excuse me, how many 21 field personnel are there to each supervisor? 22 A. [SMITH] I think Mr. McNamara may be able 23 to give you some specific information. 24 A. [McNAMARA] I guess actually I need to ask</p>	422	<p>1 information requests regarding span of control. If 2 you give us a minute, we may be able to see whether 3 or not we included damage prevention on that. 4 A. [SMITH] We believe we've provided it. 5 We're going to find the exact -- which of the 400 6 responses included that information. 7 Q. I appreciate that. 8 A. [SMITH] I apologize. I do not have them 9 all committed to memory, but I recall providing 10 that. 11 Q. Nor do I. Thank you. 12 A. [SMITH] Again, we're reviewing this. 13 There are a lot of data requests. If you'd like us 14 to, during a break, we'll find it for you, and we'll 15 give you the number back. 16 Q. Subject to check, would you say that in the 17 Massachusetts territory -- strike that -- in the 18 territory served by Boston Gas the ratio is roughly 19 five damage-prevention employees to one supervisor? 20 A. [SMITH] I would need to -- I can confirm 21 that. 22 Q. Thank you. I appreciate that. 23 Now, computers being down in the vans 24 delays work; correct?</p>

423	<p>1 A. [SMITH] It can have that impact, yes. It 2 can. 3 Q. Has the company initiated any analysis of 4 how much delay has been caused by the loss of 5 connectivity to the vans? 6 A. [SMITH] I am not aware of any analysis 7 that has been conducted regarding the time lost due 8 to connectivity issues. 9 Q. Are you aware of any analysis that has been 10 done relative to the age and -- to the age and 11 decreasing usefulness of the company's existing 12 technology in its vans, the Toughbooks? 13 A. [SMITH] I don't know whether there's a 14 specific detailed analysis or report; but the 15 company is aware of those issues, and it is one of 16 the -- you know, certainly it's an issue that's 17 going to be addressed through the gas business 18 enablement program. So the company is aware of the 19 age and the usefulness of its existing terminals in 20 the trucks. 21 Q. You would agree with me that when work is 22 delayed the cost of labor increases; correct? 23 Because you have more folks sitting in their vans or 24 standing on the street not doing their work?</p>	425	<p>1 wondering if you can provide us the timeline for 2 when the legacy technology in the vans will be 3 replaced by the GBE technology. 4 A. [SMITH] I can tell you that we are in the 5 process of rolling that out and that there is a 6 specific schedule, and it's going to vary area by 7 area, and the GBE panel I am sure will be able to 8 provide you with the details. 9 Q. Thank you. Aside from proposing and 10 commencing with the implementation of the GBE, what 11 concrete actions has the company taken since the 12 beginning of the test year to reduce connectivity 13 problems with the Toughbooks? 14 A. [SMITH] So as the company is made aware of 15 the issues, we do have personnel in place to go out 16 to attempt to address the issues. If there's 17 something that they can do to repair the terminal or 18 get it working again, they address that. 19 In addition to that, all employees are 20 trained on what they need to do if there is not 21 connectivity, and that is to contact their 22 supervisor to let them know of the issue and to 23 request, if there's no other way to access the 24 documents they need to complete the work, that they</p>
424	<p>1 A. [SMITH] Again, there are some alternatives 2 that are available to the crews if they do lose 3 connectivity. So in some instances it may cause 4 delays to the job. They may not be significant 5 enough to have a significant impact to the labor 6 delay. But it would be dependent on the individual 7 situation. It is possible that for individual jobs 8 it could cause delays or increase costs. 9 Q. Has there been any analysis of the cost of 10 labor resulting from issues with connectivity or 11 other problems with the aging computer systems in 12 the vehicles? 13 A. [SMITH] I am not aware of any specific 14 analysis that has been conducted. 15 Q. Thank you. Has the company calculated the 16 time and money lost due to the faulty connectivity 17 and other issues on the Toughbooks? 18 A. [SMITH] Again, the company is generally 19 aware of the issues, acknowledges that it does lead 20 to lost time with the crews. I am not aware of 21 specific analysis that exists that calculates the 22 value of that loss. 23 Q. Now, we understand that there's a GBE panel 24 that is going to explain the new technology. We're</p>	426	<p>1 will be brought to them in the field. 2 Q. So the supervisor will have to commute out 3 to whatever the field location is? 4 A. [SMITH] Or other personnel who might be 5 available to deliver that. They're instructed to 6 contact their supervisors. If the supervisor is not 7 able to, other personnel are able to bring records 8 to the field. 9 Q. Okay. Are you aware of the number -- 10 strike that. Does the company keep statistics on 11 the number of times supervisors or others are 12 required to go out with maps in the field? 13 A. [SMITH] I do not know if the company 14 compiles that information in any sort of file or 15 location. 16 Q. I'd like to make a record request: To the 17 extent that the company keeps these records, for the 18 test year, 2017, and the current year, how many 19 times have supervisors and others been required to 20 go out with maps and records to field locations. 21 A. [SMITH] I understand the request. Again, 22 I'll state, I do not believe the company tracks the 23 number of instances, but we can check. 24 Q. If the company doesn't keep the records,</p>

427	<p>1 the company doesn't keep the records. 2 MS. KIMBALL: So the test year is 2016. 3 MS. DECTER: Okay. 4 Q. So you said test year 2017, but you just 5 want -- 6 MS. DECTER: No, I said the test year, 7 2017, and 2018. Thank you. 8 MS. PIEPER: That's going to be Record 9 Request USW-10. 10 (Record Request USW-10.) 11 Q. I want to ask you a few questions that 12 relate to your testimony starting on Page 6 about 13 GBE. But if you believe they're better served in 14 the GBE panel, then we can just skip along. 15 A. [SMITH] Let's give it a try. 16 Q. So you're going to tell me. 17 A. [SMITH] Sure. 18 Q. So when you refer to the GBE program 19 standardizing the company's systems standard in all 20 its operating territories, including the 21 availability of map locations for all work, in 22 response to the second question, are you talking 23 about digital images of the company's hand-drawn 24 maps?</p>	429	<p>1 to clerks within the company who are responsible for 2 uploading that information into the system. 3 So the source of the information is 4 actually the crews themselves out in the field. And 5 as it will be in the future, I believe the methods 6 by which the maps and records will be updated will 7 change with GBE, but that panel would best be suited 8 to provide you with the details. 9 Q. Can you tell me, when you talk about 10 completion data on mains and services and field 11 data -- and you're talking about it being both -- 12 strike that. 13 Let's go to Page 8. When you say, "For 14 example, the GBE program will allow employees to 15 easily access gas operations data, archived 16 historical and current, for reporting capabilities," 17 the historical data you're talking about, is that 18 coming from SPIPE, New England GIS, ArcGIS, or is it 19 coming from a different source altogether? 20 A. [SMITH] So the mechanism by which the data 21 will be provided, that is a question that is best 22 asked to the GBE panel. But, you know, my 23 understanding is that that historical data in 24 existing systems will remain available for use.</p>
428	<p>1 A. [SMITH] I will defer that to the GBE 2 panel. But whatever it is they are implementing, it 3 will be standard across all of our service 4 territories. 5 Q. So the GBE isn't going to reduce the work 6 of correcting the company's maps, is it? 7 A. [McNAMARA] I'm not sure I understand the 8 question. 9 A. [SMITH] I'm not sure I understand the 10 question. 11 Q. I guess my question is: What data is the 12 GBE going to utilize? We understand GBE is a big 13 technology system and that it's going to make 14 records accessible. The question is, where is the 15 data coming from? Is it coming from the legacy 16 mapping system? Is it coming from another source? 17 That's what we're interested in. 18 A. [SMITH] Understood, and I will defer that 19 to the GBE panel. But again, you know, we will have 20 legacy system information that is available, and 21 through GBE new information will be available to 22 update in general to the map, and general mapping 23 information comes from the folks who complete the 24 work in the field. The records are provided today</p>	430	<p>1 Access to that data once GBE is implemented will be 2 made easier through the use of updated equipment in 3 the field, iPads and such, that people will be able 4 to access those systems that they're currently 5 accessing through their Toughbooks today. 6 Q. And just so we're clear, iPads aren't 7 available currently to rank-and-file field staff; 8 correct? 9 A. [SMITH] I believe there may be in some 10 areas, as a pilot program, some rank-and-file 11 employees who have been issued iPads. 12 Q. Which areas are those? 13 A. [SMITH] I do not have the specific detail 14 on that. Perhaps Mr. McNamara? 15 A. [McNAMARA] There's been limited 16 deployment -- we're speaking specifically about 17 steelworkers territory. We've had some folks 18 participate in a pilot program through GBE, maybe a 19 dozen or so folks. But it's a very limited 20 deployment. The actual rollout will be part of the 21 GBE implementation plan. 22 Q. When will that rollout happen? 23 A. [McNAMARA] I'm not privy to -- or 24 memorized the schedule. The GBE panel will have</p>

431	<p>1 that.</p> <p>2 Q. We'll ask the panel. Now, GBE is going to</p> <p>3 be used by both employees and contractors; correct?</p> <p>4 A. [McNAMARA] That is my understanding.</p> <p>5 Q. Now, in recent years both the union and its</p> <p>6 members have raised concerns that the company's</p> <p>7 sketching and mapping has been inaccurate; correct?</p> <p>8 A. [McNAMARA] The union has raised those</p> <p>9 concerns previously, yes.</p> <p>10 Q. And in fact, in response to USW-4-41, which</p> <p>11 Ms. Smith was a sponsor in part -- if you want to</p> <p>12 look at it.</p> <p>13 A. [SMITH] Would that be 4-41?</p> <p>14 Q. 4-41, yeah.</p> <p>15 A. [SMITH] I have the response.</p> <p>16 Q. So you note that "National Grid is aware of</p> <p>17 a large number of help desk tickets that have been</p> <p>18 raised related to the aged infrastructure and other</p> <p>19 issues tied to SPIPE and GIS databases." Do you see</p> <p>20 that?</p> <p>21 A. [SMITH] I do.</p> <p>22 Q. Do you agree with that testimony?</p> <p>23 A. [SMITH] I do.</p> <p>24 Q. And when you say "aged infrastructure and</p>	433	<p>1 Q. Do you keep records of how many</p> <p>2 communications concerning inaccuracies in SPIPE and</p> <p>3 the GIS databases the company gets each year?</p> <p>4 A. [SMITH] I do not know whether we track</p> <p>5 that information.</p> <p>6 Q. Okay. I'd like to draw your attention to</p> <p>7 your response to USW-4-37.</p> <p>8 A. [SMITH] I have that response.</p> <p>9 Q. Does this refresh your memory as to whether</p> <p>10 the company keeps records about complaints</p> <p>11 concerning inaccuracies or notes for corrections?</p> <p>12 A. [SMITH] Yes. I did not recall whether</p> <p>13 they were aware, but this response provides a table.</p> <p>14 It also says it does not track the type of data</p> <p>15 correction, whether it's on a main versus a service;</p> <p>16 but it does track in four specific categories.</p> <p>17 Q. Thank you. And is this, to your knowledge,</p> <p>18 accurate?</p> <p>19 A. [SMITH] It is.</p> <p>20 Q. And does it cover just the Massachusetts</p> <p>21 gas service territory?</p> <p>22 A. [SMITH] This covers just Massachusetts.</p> <p>23 Q. Thank you. I appreciate that. Has the</p> <p>24 company performed any spot checks or audited</p>
432	<p>1 other issues," what are you talking about?</p> <p>2 A. [SMITH] It is referring to the older</p> <p>3 systems that we have, and the terminals in the</p> <p>4 trucks, et cetera.</p> <p>5 Q. And whether or not the information in SPIPE</p> <p>6 and the GIS databases is accurate?</p> <p>7 A. [SMITH] I do not believe that this</p> <p>8 response refers to the accuracy of the data.</p> <p>9 Q. So what are the other issues tied to SPIPE</p> <p>10 and GIS databases?</p> <p>11 A. [SMITH] This is referring to the issues</p> <p>12 with access to those databases.</p> <p>13 Q. And aged infrastructure, what's that</p> <p>14 referring to?</p> <p>15 A. [SMITH] That's referring to the older</p> <p>16 terminals in the trucks that are creating the issues</p> <p>17 with accessing those systems.</p> <p>18 Q. I see. So are you aware of tickets to</p> <p>19 mapping and engineering concerning inaccuracies in</p> <p>20 the SPIPE and GIS databases?</p> <p>21 A. [SMITH] I am generally aware that if</p> <p>22 employees have issues or they find inaccuracies that</p> <p>23 they will create a communication to inform us of</p> <p>24 those inaccuracies and ask for a correction.</p>	434	<p>1 contractor sketching that's provided to mapping and</p> <p>2 engineering?</p> <p>3 A. [SMITH] I am not personally aware of any</p> <p>4 audits that have been conducted on that topic.</p> <p>5 Q. Who would be?</p> <p>6 A. [SMITH] We can check with appropriate</p> <p>7 personnel in the company, if you would like to ask.</p> <p>8 Q. I'd like to make a record request, for any</p> <p>9 audits or records -- or for any audits conducted of</p> <p>10 contractor sketching that was provided to the</p> <p>11 company's mapping department for corrections to its</p> <p>12 map system and whether the company has any program</p> <p>13 of doing spot checks or any other program to ensure</p> <p>14 the quality of sketches provided to contractors --</p> <p>15 or provided by contractors.</p> <p>16 MS. PIEPER: That's going to be Record</p> <p>17 Request USW-11. And you understand what it is that</p> <p>18 she's looking for?</p> <p>19 WITNESS SMITH: I do.</p> <p>20 MS. DECTER: Thank you.</p> <p>21 (Record Request USW-11.)</p> <p>22 Q. Does the GBE have any method or technology</p> <p>23 to make sketching main and service replacements more</p> <p>24 accurate or to create any accountability, as far as</p>

435	<p>1 you know?</p> <p>2 A. [SMITH] That question will be best asked</p> <p>3 of the GBE panel.</p> <p>4 Q. Okey-doke. Has the company offered sketch</p> <p>5 training to contractors performing main and service</p> <p>6 replacements?</p> <p>7 A. [SMITH] Yes, I believe our testimony</p> <p>8 indicated that that training has been offered.</p> <p>9 Q. Can you direct me to where your testimony</p> <p>10 states that?</p> <p>11 Perhaps I can assist you. If you turn</p> <p>12 to Page 9. You state that the company has performed</p> <p>13 training sessions across the Massachusetts gas field</p> <p>14 operating yards --</p> <p>15 You state that "The company has</p> <p>16 performed training sessions across the Massachusetts</p> <p>17 gas field operating yards to upskill crew leaders on</p> <p>18 necessary information for field sketches." Is that</p> <p>19 what you're referring to?</p> <p>20 A. [SMITH] That is correct.</p> <p>21 Q. So when you say that, you're only talking</p> <p>22 about contractors; correct? You're not talking</p> <p>23 about in-house staff?</p> <p>24 A. [SMITH] I would need to confirm whether it</p>	437	<p>1 Q. So they do repairs, they respond to</p> <p>2 emergencies; correct?</p> <p>3 A. [SMITH] They do that as well. The</p> <p>4 contractors do not do repairs or respond to</p> <p>5 emergencies. The contractors do the majority of</p> <p>6 the -- our contractors do the majority of the main</p> <p>7 installation or main replacement work.</p> <p>8 Q. I'd like to make a record request for the</p> <p>9 percentage of main replacement work performed by</p> <p>10 in-house staff in National Grid's Massachusetts</p> <p>11 service territory.</p> <p>12 MS. PIEPER: Over what time period?</p> <p>13 MS. DECTER: Let's say for the test year</p> <p>14 and 2017.</p> <p>15 MS. PIEPER: And you understand what</p> <p>16 she's looking for?</p> <p>17 WITNESS SMITH: I do. We will provide</p> <p>18 that.</p> <p>19 A. [SMITH] And if it helps you: It is a</p> <p>20 fairly large percent.</p> <p>21 MS. PIEPER: It's Record Request USW-12.</p> <p>22 (Record Request USW-12.)</p> <p>23 Q. So going back to the original line of</p> <p>24 questioning: Is it your testimony as you sit here</p>
436	<p>1 includes both. I believe that we do provide -- we</p> <p>2 provide extensive training to our in-house field</p> <p>3 forces, who are responsible for doing that type of</p> <p>4 work to the crew leaders, if they are engaged in</p> <p>5 that type of work, as well as our contractors. It</p> <p>6 would be part of training.</p> <p>7 Q. Let me see if I can refresh your memory.</p> <p>8 After the sentence that I excerpted, it says, "These</p> <p>9 measures reduced the gas main backlog from 104 miles</p> <p>10 and a cycle time of 136 days to seven miles and a</p> <p>11 cycle time of 35 days." Who does the vast majority</p> <p>12 of work on mains within the Massachusetts territory?</p> <p>13 A. [SMITH] When it comes to the installation</p> <p>14 or replacement of gas mains, the majority of work is</p> <p>15 done by our contractor workforce.</p> <p>16 Q. What percentage is done by in-house staff?</p> <p>17 A. [SMITH] I do not have the exact</p> <p>18 percentage. It is less than what is done by</p> <p>19 contractors, but our in-house crews do do work on</p> <p>20 mains. They do the majority of work on mains that</p> <p>21 are -- main work that is 50 feet or less, smaller</p> <p>22 main jobs, but they also do engage in some longer</p> <p>23 main work. I don't have the exact percentage at my</p> <p>24 fingertips here.</p>	438	<p>1 today that both in-house and contractor crews</p> <p>2 received upskill training on field sketches?</p> <p>3 A. [SMITH] So we train -- any employee of</p> <p>4 ours who is responsible for field sketches would</p> <p>5 receive training on field sketches, and if those</p> <p>6 employees need additional assistance, they know that</p> <p>7 they are able to ask for additional assistance if</p> <p>8 they need it.</p> <p>9 Q. Can you tell me when these trainings were</p> <p>10 provided to in-house staff?</p> <p>11 A. [SMITH] I would not -- I do not know the</p> <p>12 specific dates or times that this training was</p> <p>13 provided. I just wouldn't have the dates and times</p> <p>14 available to me, but we can get those for you.</p> <p>15 Q. I'd like to make a record request, for the</p> <p>16 dates and times of training offered on sketching to</p> <p>17 in-house staff as well as the content of the</p> <p>18 training and the number of hours that the training</p> <p>19 took up.</p> <p>20 A. [SMITH] We'll provide you with whatever</p> <p>21 information is available.</p> <p>22 Q. Thank you. I appreciate that.</p> <p>23 MS. PIEPER: And we don't think this is</p> <p>24 already in the record?</p>

439	<p>1 MS. DECTER: No.</p> <p>2 MS. PIEPER: That's going to be Record</p> <p>3 Request USW-13.</p> <p>4 (Record Request USW-13.)</p> <p>5 Q. Other than the training that was provided</p> <p>6 to in-house -- or to contractors and perhaps</p> <p>7 in-house staff, what other concrete measures has the</p> <p>8 company taken to improve the accuracy of sketching</p> <p>9 on new and replaced mains and services?</p> <p>10 A. [SMITH] Other than the additional</p> <p>11 training, I am not aware of, but I am happy to check</p> <p>12 and see if additional measures have been taken to</p> <p>13 improve the accuracy.</p> <p>14 Q. I would appreciate that. I'd like to ask a</p> <p>15 record request, for any additional measures that</p> <p>16 have been taken to -- other than training that have</p> <p>17 been taken to improve the accuracy of sketching on</p> <p>18 new and replaced mains and services in the</p> <p>19 Massachusetts service territory.</p> <p>20 MS. PIEPER: That's going to be Record</p> <p>21 Request USW-14.</p> <p>22 (Record Request USW-14.)</p> <p>23 Q. I'd like to direct your attention to Page</p> <p>24 10. Actually, you know? We'll leave that for GBE.</p>	441	<p>1 curriculum redesign of technical training. Has the</p> <p>2 comprehensive three-to-five-year road map to</p> <p>3 significantly improve training for field forces that</p> <p>4 you refer to been finalized?</p> <p>5 A. [McNAMARA] Yes, it has.</p> <p>6 Q. Has it been provided in response to any</p> <p>7 discovery or record request in this proceeding?</p> <p>8 A. [McNAMARA] I am not aware of it.</p> <p>9 A. [SMITH] I do not believe it has been</p> <p>10 requested.</p> <p>11 Q. We'd like to make a record request, for the</p> <p>12 comprehensive three-to-five-year road map to</p> <p>13 significantly improve training for field forces that</p> <p>14 has apparently been finalized. When was it</p> <p>15 finalized?</p> <p>16 A. [McNAMARA] It was finalized a couple of</p> <p>17 months ago, and we're actually in the process of an</p> <p>18 RFP to go out to start the implementation of the</p> <p>19 road map.</p> <p>20 MS. PIEPER: Can I get a record request</p> <p>21 number in there before you keep talking?</p> <p>22 MS. DECTER: I apologize.</p> <p>23 MS. PIEPER: It's Record Request USW-16.</p> <p>24 (Record Request USW-16.)</p>
440	<p>1 I apologize.</p> <p>2 Let's go to Pages 12 and 13 of your</p> <p>3 testimony. How many days of classroom training is</p> <p>4 currently provided to new damage prevention</p> <p>5 employees -- not incumbents who are transferred into</p> <p>6 damage prevention, but new employees starting at the</p> <p>7 company in damage prevention?</p> <p>8 A. [McNAMARA] The exact number of days I'm</p> <p>9 not sure of. We'd have to check that with the</p> <p>10 training group.</p> <p>11 Q. I'd like to make a record request for the</p> <p>12 number of days of classroom training currently</p> <p>13 provided to new employees who are placed in damage</p> <p>14 prevention as their first position.</p> <p>15 MS. PIEPER: Is that your record</p> <p>16 request?</p> <p>17 MS. DECTER: That, and we'd like a copy</p> <p>18 of the training materials provided to them.</p> <p>19 MS. PIEPER: That's going to be Record</p> <p>20 Request USW-15.</p> <p>21 You understand what she's looking for?</p> <p>22 WITNESS McNAMARA: Yes.</p> <p>23 (Record Request USW-15.)</p> <p>24 Q. On Page 13 you talk about a significant</p>	442	<p>1 Q. Has the RFP already been finalized?</p> <p>2 A. [McNAMARA] Yes, it has.</p> <p>3 Q. We'd like to make a record request for the</p> <p>4 RFP. And the RFP is for what, exactly?</p> <p>5 A. [McNAMARA] It's a number of functions to</p> <p>6 develop the road map to predominantly work on</p> <p>7 curriculum redesign, new technology, structured and</p> <p>8 sustainable on-the-job training programs, and the</p> <p>9 development of training effectiveness metrics.</p> <p>10 MS. PIEPER: I'm going to amend Record</p> <p>11 Request USW-16. You want the road map, the</p> <p>12 three-to-five-year road map to significantly improve</p> <p>13 training for field forces and the RFP?</p> <p>14 MS. DECTER: Yes.</p> <p>15 MS. PIEPER: And that's USW-16.</p> <p>16 (Record Request USW-16 amendment.)</p> <p>17 Q. Who created the road map?</p> <p>18 A. [McNAMARA] National Grid created the road</p> <p>19 map in conjunction with outside consultants.</p> <p>20 Q. Which office was charged with the job of</p> <p>21 creating the road map?</p> <p>22 A. [McNAMARA] This was part of and is part of</p> <p>23 the gas business enablement program.</p> <p>24 Q. So who is the principal of the gas business</p>

443	<p>1 enablement program?</p> <p>2 A. [McNAMARA] The principal of the gas</p> <p>3 business enablement program is Johnny Johnston.</p> <p>4 Q. Where is Mr. Johnston located?</p> <p>5 A. [McNAMARA] Mr. Johnston is located --</p> <p>6 Q. Right there. What is his geographic</p> <p>7 assignment normally?</p> <p>8 A. [McNAMARA] I believe his current office</p> <p>9 location is on Wyman Street in Waltham.</p> <p>10 Q. Thank you. If you know, when will the</p> <p>11 first trainings under the GBE road map begin?</p> <p>12 A. [McNAMARA] We've actually done some pilot</p> <p>13 work in Massachusetts as part of the development of</p> <p>14 the road map. So some new training and new</p> <p>15 curriculum has already been developed, and that's</p> <p>16 been rolled out for customer metering services and</p> <p>17 construction and maintenance.</p> <p>18 Q. Where has that been rolled out?</p> <p>19 A. [McNAMARA] Again, Massachusetts, at our</p> <p>20 Millbury training center.</p> <p>21 Q. And how many students have gone through</p> <p>22 that program so far?</p> <p>23 A. [McNAMARA] Approximately 30.</p> <p>24 Q. And what service territory have those folks</p>	445	<p>1 of our locals on implementing structured OJT, or</p> <p>2 structured on-the-job training, which the bargaining</p> <p>3 unit will potentially, if we reach agreement on</p> <p>4 these issues, participate in this training.</p> <p>5 Q. Thank you. Turning back to Page 6 and 7 of</p> <p>6 your testimony: You talk about issues with being</p> <p>7 unable to, you know -- strike that. Hold on just</p> <p>8 one second.</p> <p>9 I apologize. Turning back to Page 7 of</p> <p>10 your testimony. You talk about significant backlogs</p> <p>11 in updating mapping. Correct?</p> <p>12 A. [SMITH] We have experienced in the past</p> <p>13 some backlogs in mapping. And then I believe, if</p> <p>14 you flip over to Pages 8 and 9, we talk about some</p> <p>15 of the things that we have done to reduce those</p> <p>16 backlogs.</p> <p>17 Q. Indeed, indeed. Accurate mapping of mains</p> <p>18 and services is a safety imperative; correct?</p> <p>19 A. [SMITH] Absolutely.</p> <p>20 A. [McNAMARA] It is.</p> <p>21 Q. And that is because it provides essential</p> <p>22 information for operations, maintenance, and</p> <p>23 construction; correct?</p> <p>24 A. [McNAMARA] Correct.</p>
444	<p>1 been from?</p> <p>2 A. [McNAMARA] There have been a couple of</p> <p>3 students -- we tried to cover multiple geographic</p> <p>4 areas, so a handful of students from each of our</p> <p>5 different geographic areas in Massachusetts.</p> <p>6 Q. Thank you. When will it be rolled out to</p> <p>7 the field staff generally?</p> <p>8 A. [McNAMARA] As we mention in the testimony,</p> <p>9 it's an overall three-to-five-year road map, so it</p> <p>10 will come out in phases over the next couple of</p> <p>11 years.</p> <p>12 Q. Okay. But the curriculum has not been</p> <p>13 finalized at this point?</p> <p>14 A. [McNAMARA] Correct.</p> <p>15 Q. Okay, thank you. Will the trainings be</p> <p>16 done in-house or by contractors?</p> <p>17 A. [McNAMARA] As of right now the training is</p> <p>18 all done in-house. There is no discussion at this</p> <p>19 point to use contractors for training.</p> <p>20 Q. And will it be done by organized staff or</p> <p>21 by supervisors?</p> <p>22 A. [McNAMARA] Training will actually be done</p> <p>23 by -- currently our instructors are management</p> <p>24 staff. However, we are in discussions with a number</p>	446	<p>1 Q. It's also essential for emergencies;</p> <p>2 correct?</p> <p>3 A. [McNAMARA] Correct.</p> <p>4 Q. Would you agree that it's also important</p> <p>5 because occasionally -- it's important in the damage</p> <p>6 prevention context because locating equipment fails</p> <p>7 sometimes to locate piping? Correct?</p> <p>8 A. [McNAMARA] I need you to repeat the</p> <p>9 question.</p> <p>10 Q. Okay, that's fine. Having accurate mapping</p> <p>11 of mains and services is also important because</p> <p>12 there are times when the equipment used to locate</p> <p>13 piping fails to accurately locate the piping, for</p> <p>14 markout and for other damage prevention work?</p> <p>15 A. [McNAMARA] I would agree it's important to</p> <p>16 have both tools, accurate maps and tools that work,</p> <p>17 yes.</p> <p>18 Q. And, of course, accurate mapping is partly</p> <p>19 a function of accurate sketching when a job has been</p> <p>20 completed; correct?</p> <p>21 A. [McNAMARA] Correct.</p> <p>22 Q. Okay, thank you. In your testimony, Ms.</p> <p>23 Smith and Mr. McNamara, you talk about a cyclical</p> <p>24 backlog related to construction season; correct?</p>

447	<p>1 A. [SMITH] Correct.</p> <p>2 Q. Now, in 2014 there was a backlog reported</p> <p>3 to the union, Local 12003, of 55,000 pieces of</p> <p>4 updates that needed to be made to the mapping</p> <p>5 season. Are you familiar with that?</p> <p>6 A. [McNAMARA] I'm not familiar with that</p> <p>7 number.</p> <p>8 A. [SMITH] Can you cite to a data response</p> <p>9 that we provided?</p> <p>10 Q. No. I have with Mr. Kirylo's testimony</p> <p>11 there's an exhibit that we've sponsored -- let me</p> <p>12 ask you another way.</p> <p>13 Are you familiar with some circumstances</p> <p>14 in which backlogs of mapping updates have not been</p> <p>15 related to construction season, to cyclical upticks</p> <p>16 in construction, but are rather either only</p> <p>17 partially related to construction upticks or are not</p> <p>18 related at all, related to other factors?</p> <p>19 A. [SMITH] So I would need to check in with</p> <p>20 our records and see whether we would track the</p> <p>21 reasons, specific reasons, for delays that would</p> <p>22 occur by category. I'm not aware whether or not we</p> <p>23 do track it in that fashion.</p> <p>24 Q. But you are not personally familiar with</p>	449	<p>1 staffing levels and so forth. It may be contained</p> <p>2 within those documents. We'd need to check.</p> <p>3 MS. PIEPER: Is that something you can</p> <p>4 look up on break?</p> <p>5 WITNESS SMITH: We can, yes.</p> <p>6 MS. PIEPER: Thank you.</p> <p>7 Q. Subject to check, isn't it true that there</p> <p>8 was significant attrition in the mapping department</p> <p>9 between 2012 and 2014?</p> <p>10 A. [SMITH] I wouldn't have any specific</p> <p>11 knowledge of that, so I would need to confirm</p> <p>12 whether or not that was correct.</p> <p>13 Q. Are you able to confirm during the break?</p> <p>14 A. [SMITH] If that information is contained</p> <p>15 in another information response, then we'd be able</p> <p>16 to confirm the change in numbers in the department.</p> <p>17 Q. Okay, thank you. I appreciate that.</p> <p>18 If not, we'd like to make a record</p> <p>19 request for the --</p> <p>20 MS. PIEPER: But she's going to check on</p> <p>21 the break first, right?</p> <p>22 MS. DECTER: Okay.</p> <p>23 Q. Just so we're clear, specifically what I'd</p> <p>24 like to know, just to avoid the cascade of questions</p>
448	<p>1 circumstances other than construction-season</p> <p>2 increases in main and service replacements?</p> <p>3 A. [McNAMARA] For me that would be fair, yes.</p> <p>4 A. [SMITH] I do not have specific knowledge</p> <p>5 of the reasons other than just generally the reasons</p> <p>6 that we've stated.</p> <p>7 Q. Are either of you aware of the staffing in</p> <p>8 mapping and engineering prior to 2014?</p> <p>9 A. [SMITH] I would not have the specific</p> <p>10 numbers. What I am aware of is that we have</p> <p>11 recently added personnel to the mapping area to help</p> <p>12 alleviate some of the issues with backlog building</p> <p>13 up, especially toward the end of the construction</p> <p>14 system. I believe our testimony indicates that we</p> <p>15 recently added eight mapping employees.</p> <p>16 Q. How many mapping employees do you currently</p> <p>17 have employed in the mapping department?</p> <p>18 A. [SMITH] I'm not sure whether that</p> <p>19 information may have been provided by another</p> <p>20 witness in the case, so I'd just need to confirm</p> <p>21 what the total number is.</p> <p>22 I was just going to say, I believe there</p> <p>23 are some information requests that were responded to</p> <p>24 by our human resources witness in the case on</p>	450	<p>1 you won't be able to answer as you sit here this</p> <p>2 moment, I'm looking for the number of employees in</p> <p>3 mapping in 2012, the number in 2014, the number</p> <p>4 during the test year, and the number as of the</p> <p>5 present date. Okay? Thank you.</p> <p>6 Now, since you increased staffing in the</p> <p>7 last 18 months -- by eight, according to your</p> <p>8 testimony -- during the same period the backlog has</p> <p>9 increased considerably; correct?</p> <p>10 A. [SMITH] Correct.</p> <p>11 Q. So the staffing of the mapping department</p> <p>12 is a major factor, wouldn't you agree, in reducing</p> <p>13 the backlog in mapping changes; correct?</p> <p>14 A. [SMITH] Having the appropriate level of</p> <p>15 staffing based on the amount of mapping work that</p> <p>16 needs to be completed is essential.</p> <p>17 Q. Thank you.</p> <p>18 MS. PIEPER: I'd like to take a break</p> <p>19 whenever you're at a good stopping point.</p> <p>20 MS. DECTER: We can take a break right</p> <p>21 now. That would be fine.</p> <p>22 MS. PIEPER: Before we go on break, I</p> <p>23 checked with our staff on the allocated</p> <p>24 cost-of-service witness, and they do not have any</p>

<p style="text-align: right;">451</p> <p>1 questions.</p> <p>2 MS. KIMBALL: Great. Thanks.</p> <p>3 MS. PIEPER: Let's go off the record.</p> <p>4 (Recess taken.)</p> <p>5 MS. PIEPER: Let's go back on the</p> <p>6 record. I remind the witnesses that you remain</p> <p>7 sworn. And you may proceed.</p> <p>8 MS. DECTER: Thank you.</p> <p>9 Q. So earlier in your testimony I had asked</p> <p>10 you a question about ArcGIS, and then I had also</p> <p>11 used the title New England GIS. Are those two</p> <p>12 different systems?</p> <p>13 A. [SMITH] I do not know if those are two</p> <p>14 names for the same system.</p> <p>15 Q. Subject to check, would you agree that</p> <p>16 ArcGIS is the legacy system that was abandoned</p> <p>17 approximately one year ago and New England GIS is</p> <p>18 the new system that has been in place since roughly</p> <p>19 April 1, 2017?</p> <p>20 A. [SMITH] Sure, subject to check.</p> <p>21 Q. Thank you. All right, let's move on to</p> <p>22 Page 16 of your testimony.</p> <p>23 MS. PIEPER: There were a couple of</p> <p>24 things they were going to check on break.</p>	<p style="text-align: right;">453</p> <p>1 Q. In your testimony at the bottom of Page 16</p> <p>2 you say that the company's IT help desk is available</p> <p>3 24 hours per day to assist with a broad range of IT</p> <p>4 issues. Do you see that?</p> <p>5 A. [SMITH] I do.</p> <p>6 Q. When you say 24 hours per day, are you</p> <p>7 talking about seven days a week, five days a week?</p> <p>8 How many days a week?</p> <p>9 A. [SMITH] So, again, my general familiarity</p> <p>10 with the help desk is as a user of the help desk,</p> <p>11 and whenever I have a problem, any time of day or</p> <p>12 night, I call and somebody answers the phone to</p> <p>13 field my request.</p> <p>14 Q. Is it your testimony here today that the IS</p> <p>15 panel would be able to answer questions concerning</p> <p>16 the availability and services provided by the help</p> <p>17 desk contractor?</p> <p>18 A. [SMITH] Yes.</p> <p>19 A. [McNAMARA] Yes.</p> <p>20 MS. KIMBALL: Correct.</p> <p>21 Q. Then we'll reserve for that.</p> <p>22 Does the company track complaints about</p> <p>23 untimely responses from the help desk in assisting</p> <p>24 in-house staff?</p>
<p style="text-align: right;">452</p> <p>1 MS. DECTER: I'm sorry. I didn't ask.</p> <p>2 MS. PIEPER: Were you able to find that</p> <p>3 information out?</p> <p>4 MS. KIMBALL: We are going to need to</p> <p>5 check on lunch break on those, because we need to</p> <p>6 like phone home.</p> <p>7 MS. PIEPER: We'll hold that, then.</p> <p>8 Thank you.</p> <p>9 MS. DECTER: Thank you.</p> <p>10 Q. During the test year who was the help desk</p> <p>11 IT contractor?</p> <p>12 A. [SMITH] I do not know the name of the</p> <p>13 contractor.</p> <p>14 Q. Is there someone in the room who is aware</p> <p>15 of the IT contractor -- or the help desk contractor?</p> <p>16 A. [SMITH] We believe it's HP, Hewlett</p> <p>17 Packard.</p> <p>18 Q. And when did National Grid's relationship</p> <p>19 with that vendor end as a help desk -- as the help</p> <p>20 desk contractor?</p> <p>21 A. [SMITH] I do not know.</p> <p>22 MS. KIMBALL: I will just add, we have</p> <p>23 the IS panel coming in, and they are absolutely</p> <p>24 prepared to discuss anything to do with help desk.</p>	<p style="text-align: right;">454</p> <p>1 A. [SMITH] The IS panel should be able to</p> <p>2 answer that question for you.</p> <p>3 Q. On Page 21 of your testimony you mention</p> <p>4 that the company is going to train and hire 333</p> <p>5 full-time employees. Do you see that there?</p> <p>6 A. [SMITH] I do. It is in the testimony of</p> <p>7 the GSR panel where we discuss that.</p> <p>8 Q. Can you tell me whether the -- can you tell</p> <p>9 me how the company distinguishes between additional</p> <p>10 employees and individuals who are being hired into</p> <p>11 open positions that already exist?</p> <p>12 A. [SMITH] I'm not sure I understand</p> <p>13 specifically what you're asking.</p> <p>14 Q. Let me ask some questions and see if I can</p> <p>15 help you figure out how to answer; okay? Now, are</p> <p>16 you aware of statistics about attrition in each of</p> <p>17 the company's departments in its Massachusetts</p> <p>18 service territory?</p> <p>19 A. [SMITH] So I am aware that we have</p> <p>20 employees who leave the company every day and we</p> <p>21 have employees who are hired into the company every</p> <p>22 day.</p> <p>23 Q. Are you aware of whether the company</p> <p>24 maintains a practice of holding certain positions or</p>

455	<p>1 job classifications open pending bidding or pending 2 backfilling through hiring someone off the street? 3 A. [McNAMARA] Yes, we do. 4 Q. Where are statistics kept on positions that 5 are left open through attrition that the company 6 then elects to fill? 7 A. [McNAMARA] My understanding is any 8 statistics on attrition, hiring, number of open 9 vacancies at any one time is an HR function in the 10 recruiting area. 11 Q. Are you aware -- well, strike that. In 12 colloquy with the Attorney General, I believe that 13 Ms. Reed and also Ms. Heaphy said that the attrition 14 rate was approximately 5.7 percent per year. Have 15 you reviewed either of those witnesses' testimony? 16 A. [SMITH] I've not reviewed the testimony of 17 Ms. Heaphy. I was here when Ms. Reed testified. 18 What I do not know is whether specifically, if that 19 percent -- what it was meant to represent in terms 20 of departments, personnel, areas of the company. 21 Q. So what I'm interested in is whether the 22 company keeps statistics on positions that are 23 vacated through attrition and then their efforts to 24 fill those positions versus the traditional 333</p>	457	<p>1 year into that, and they are tracked separately. In 2 fact, there was an initial wave of them that we 3 started the hiring back in 2017, and those positions 4 being filled were tracked against a list of those 5 positions. 6 The other thing that I can offer up or 7 tell you is that even though we hired some folks in 8 2017 into those positions, ultimately there may have 9 been some attrition in those positions as well, so 10 employees didn't make it through training, for 11 example -- they either failed their training or 12 during the course of training decided that the type 13 of work was not for them and they decided to leave 14 the company. 15 But we can tell you specifically of 16 those 333 positions how many were hired, how many 17 people are in those positions today, and we can 18 absolutely demonstrate that those are above and 19 beyond positions that were in the test year. I 20 believe there may be -- and we can check perhaps 21 during the lunch break -- there has been some 22 discovery around that, and we can point you to that. 23 Q. So in addition to the 1058, which, I 24 believe, is the head count for December 2016, you're</p>
456	<p>1 hires that the company is saying it is about to make 2 or that it is in the process of making? 3 A. [SMITH] So the company does through its HR 4 systems have records of the number of positions that 5 the company has, how many are filled, and how many 6 are vacant. 7 Q. So I'd like to make a record request for 8 how the company distinguishes between hires made to 9 vacant positions that pre-exist its decision to make 10 333 new hires and the 333 new-hires positions. 11 A. [SMITH] I think I may be able to answer 12 some of that for you here, so why don't we give you 13 a try, and if I haven't satisfied your response, we 14 can talk about a record request. 15 So for these 333 positions the company 16 has -- is tracking these as incremental hires, so 17 above and beyond the head count that we had in the 18 test year, at the end of 2016, the 333 are 19 incremental to those. Those are brand-new 20 positions. They either have people who are doing 21 current functions, to have more people do those 22 functions, or to have new people do new work or new 23 functions that we've identified. And in fact, many 24 of those positions have already been hired post test</p>	458	<p>1 saying there are going to be 333 additional hires; 2 correct? 3 A. [SMITH] In addition to what we had at the 4 end of 2016. In fact, if you could turn to 5 Information Request AG-10-18, we lay out for the 333 6 actually there were some that were hired within the 7 test year, so specifically 138 of those employees 8 were actually hired during the test year; and post 9 test year, 195 of those employees will be hired, for 10 a total of 333. 11 So within the test year we had laid out 12 the hiring plan, and the hiring was done for 138 of 13 those employees, and then in addition to that, from 14 a post-test-year perspective, there's 195. Some, 15 but probably not many, of those positions have been 16 filled in the post test year. 17 Q. So it's your testimony that of those 333, 18 over 100 were hired during the test year; correct? 19 A. [SMITH] Correct, 138. 20 And we can isolate those 138 bodies from 21 the other bodies that are in the test year, or the 22 FTEs. 23 Q. Can you tell me what job classifications 24 those individuals are in?</p>

459	<p>1 A. [SMITH] So they were in a variety of job 2 classifications. I'm also going to also say that 3 there is a response that would have the details for 4 those classifications. There's also some 5 information in the GSR testimony. But they are a 6 mix of both union and nonunion personnel to support 7 a variety of work, including some of our expanded 8 main replacement program, and the dollars associated 9 with those hires are really just the operating 10 expense numbers that have been put into the rate 11 case. 12 Q. If you want to provide the information 13 request numbers -- the response numbers, that's 14 fine. I'm happy to look there. 15 What information request is that -- 16 response is that? 17 A. [SMITH] The first one I referred to is 18 AG-10-18. In addition to that, I'd just need to go 19 through the multiple discovery. I know that there 20 were multiple questions about that. Some of them 21 may have been answered by the GSR panel, and others 22 may have potentially been answered through the HR 23 panel. So I'd just like to review and see if we've 24 provided you the details that you requested.</p>	461	<p>1 MS. KIMBALL: We will provide what is 2 available. I don't know that they're going to be 3 able to give all the job classifications, as opposed 4 to just like the number of positions open. We'll do 5 the best we can. 6 MS. DECTER: I'm sure you will. 7 MS. BLACKMORE: Can we just clarify: 8 Are we talking about represented employees? Because 9 we have a lot of departments that could potentially 10 have vacancies. 11 MS. DECTER: Hold on a second. 12 Let's just go with represented 13 employees. 14 MS. PIEPER: That's going to be Record 15 Request USW-17. 16 (Record Request USW-17.) 17 Q. I'm assuming -- I might be wrong -- that 18 these questions may be more suited to Mr. McNamara. 19 Are you aware of the number of 20 contractor crews currently operating in the Boston 21 Gas territory providing main and service replacement 22 and providing brand-new service installations? 23 Can you provide me the number of 24 contractor crews performing main and service</p>
460	<p>1 Q. Has the company provided discovery over how 2 many open positions outside those 333 positions, the 3 legacy positions of the company, how many of those 4 positions are unfilled? 5 A. [SMITH] I do not know if discovery has 6 been asked. I do not believe it was asked of either 7 the GSR panel or in relationship to the rebuttal 8 testimony. I don't believe we had any discovery on 9 the rebuttal testimony. We did -- we do have some 10 discovery through the GSR panel, and in addition the 11 HR panel may have been asked some questions, but I 12 will need to confirm that. 13 Q. I'd like to make a record request -- unless 14 you know as you sit here today -- the number of open 15 legacy positions and the job classifications for 16 each of those open positions in the Massachusetts 17 service territory in the test year, 2017, and 2018. 18 MS. KIMBALL: For that, on any given day 19 that number -- so you've just mentioned a period 20 that covers about 1,000 days. So on any given day 21 that information will be different. 22 MS. DECTER: I'm asking for 2016 and for 23 2017, I'm asking as of December 31st of each year, 24 and for 2018 I'm asking as of the present date.</p>	462	<p>1 replacements in the Boston Gas service territory? 2 A. [McNAMARA] I cannot. 3 Q. Can you provide me an approximation? 4 A. [McNAMARA] Not really. It's information 5 we could get. It's not information that's part of 6 my scope of responsibility, so I'm not the best 7 person to answer that. 8 MS. PIEPER: Would this also be the GSR 9 panel? 10 WITNESS SMITH: Yes. 11 MS. DECTER: Then we can handle it 12 there. 13 Q. If you'll look at Steelworkers 4-29. Do 14 you have it? 15 A. [SMITH] We do. 16 Q. Can you tell me whether the number of 17 inspectors listed for 2015, 2016, and 2017 is 18 limited to pipeline inspectors or whether it 19 includes pipeline inspectors as well as pavement 20 inspectors and FOI inspectors? 21 A. [SMITH] The response indicates that these 22 are the number of inspectors that oversee the 23 replacement work by contractors. 24 Q. And it doesn't include random services;</p>

<p style="text-align: right;">463</p> <p>1 correct?</p> <p>2 A. [SMITH] It does not include random</p> <p>3 services.</p> <p>4 Q. In fact, there are no inspectors who</p> <p>5 perform inspections on random services in the normal</p> <p>6 course; correct?</p> <p>7 A. [SMITH] Right. The company does not</p> <p>8 believe that there is a risk associated with the</p> <p>9 installation of random services that would require</p> <p>10 them to be subject to inspection. So there are not,</p> <p>11 yes, that is correct.</p> <p>12 Q. Thank you. Ms. Smith, were you employed by</p> <p>13 either Boston Gas or Colonial prior to National Grid</p> <p>14 taking over?</p> <p>15 A. [SMITH] So I started my career at Boston</p> <p>16 Gas Company.</p> <p>17 Q. So preceding National Grid taking over or</p> <p>18 merging with KeySpan, was there a time when random</p> <p>19 services were inspected by company inspectors?</p> <p>20 A. [SMITH] I would not know that information</p> <p>21 in those days. I was not in a position where I</p> <p>22 would have had that knowledge.</p> <p>23 Q. Thank you. Does the company have any plans</p> <p>24 to increase the number of pipeline inspectors as</p>	<p style="text-align: right;">465</p> <p>1 standards as in-house staff." Correct?</p> <p>2 A. Yes.</p> <p>3 Q. Does the company provide classroom and</p> <p>4 on-the-job training to its construction contractors?</p> <p>5 A. [McNAMARA] The company does not currently</p> <p>6 provide on-the-job or classroom training to</p> <p>7 contractors.</p> <p>8 Q. And you don't have inspectors overseeing</p> <p>9 every job -- every main and service replacement job</p> <p>10 on a day-to-day basis, do you?</p> <p>11 A. [McNAMARA] We do not.</p> <p>12 Q. And you don't have -- and every -- strike</p> <p>13 that.</p> <p>14 And you don't audit contractor work or</p> <p>15 do spot checks of contractor work on main and</p> <p>16 service replacements, do you?</p> <p>17 A. [McNAMARA] Yes, we do. We do perform</p> <p>18 QA/QC audits as well as contractors are actually</p> <p>19 overseen as well by supervision. So management has</p> <p>20 a role in overseeing the work of our contractors, in</p> <p>21 addition to the number of inspectors we have and a</p> <p>22 QA/QC program, where we do actual inspections,</p> <p>23 random inspections by the QA/QC group, as well as</p> <p>24 post-installation redigs to check the quality of our</p>
<p style="text-align: right;">464</p> <p>1 main and service replacement increases through the</p> <p>2 GSR?</p> <p>3 A. [SMITH] I believe discussions about</p> <p>4 increasing the number of represented positions are</p> <p>5 the subject of collective bargaining agreements. I</p> <p>6 am not a part of the team that is negotiating those</p> <p>7 agreements.</p> <p>8 Q. Mr. McNamara, are you aware of whether</p> <p>9 Boston Gas previously had inspectors inspecting</p> <p>10 random services?</p> <p>11 A. [McNAMARA] I believe Boston Gas years ago</p> <p>12 did have a practice of inspectors on that type of</p> <p>13 work. It wasn't necessarily related to inspection,</p> <p>14 but it was also a live gas requirement at the time.</p> <p>15 Q. Do you know when that practice ended?</p> <p>16 A. [McNAMARA] I do not.</p> <p>17 Q. As you sit here today, are you aware of any</p> <p>18 plan by the company to increase the number of</p> <p>19 inspectors, assuming that it's approved through</p> <p>20 collective bargaining, in house?</p> <p>21 A. [McNAMARA] I am not privy to any of the</p> <p>22 hiring plans or for what particular positions, no.</p> <p>23 Q. Thank you. Now, on Page 22 you testified</p> <p>24 that "Contractors are held to the same exacting</p>	<p style="text-align: right;">466</p> <p>1 contractors' work.</p> <p>2 Q. How often are QA/QC inspections performed?</p> <p>3 A. [McNAMARA] They're random. Generally a</p> <p>4 few inspections per week.</p> <p>5 MS. PIEPER: Just for the record, can</p> <p>6 you explain what QA/QC is?</p> <p>7 WITNESS McNAMARA: Sure, quality</p> <p>8 assurance and quality control inspections.</p> <p>9 MS. PIEPER: Thank you.</p> <p>10 Q. How many supervisors do you have on staff</p> <p>11 to do the QA/QC inspections?</p> <p>12 A. [McNAMARA] QA/QC supervision as opposed</p> <p>13 to --</p> <p>14 Q. Supervision, yeah.</p> <p>15 A. [McNAMARA] The organization of the group</p> <p>16 does not have supervisors. There's a manager, and</p> <p>17 then QA/QC inspectors. There's not a supervisor per</p> <p>18 se.</p> <p>19 Q. How many QA/QC inspectors are there?</p> <p>20 A. [McNAMARA] At the current time, I believe,</p> <p>21 in the Massachusetts area there are approximately</p> <p>22 10.</p> <p>23 Q. How many main and service replacement</p> <p>24 construction projects are ongoing right now in the</p>

467	<p>1 Massachusetts jurisdiction?</p> <p>2 A. [McNAMARA] That is not a number I would</p> <p>3 have.</p> <p>4 Q. I'd like to ask a record request for the</p> <p>5 number of main and service replacement construction</p> <p>6 sites currently operating as of today's date.</p> <p>7 MS. PIEPER: That's going to be Record</p> <p>8 Request USW-18. And that's information you're able</p> <p>9 to obtain?</p> <p>10 A. [SMITH] Absolutely.</p> <p>11 (Record Request USW-18.)</p> <p>12 MS. PIEPER: If you could continue to</p> <p>13 speak loud. It's hard to hear.</p> <p>14 MS. DECTER: I will try.</p> <p>15 Q. I'd like to ask the same question to you</p> <p>16 about redigs: How frequently do you do redigs?</p> <p>17 A. [McNAMARA] There's an annual program, I</p> <p>18 don't have the numbers. But there's an annual redig</p> <p>19 program where a certain number of jobs are selected</p> <p>20 at random for redig and inspection. Those are</p> <p>21 numbers that we could provide. I don't have them</p> <p>22 readily available.</p> <p>23 Q. So we would like the number of redigs that</p> <p>24 have taken place in 2015, 2016, 2017, and 2018 as of</p>	469	<p>1 taken by the company when it was discovered that the</p> <p>2 low-pressure fitting had been placed on</p> <p>3 high-pressure pipe?</p> <p>4 A. [McNAMARA] I believe an incident analysis</p> <p>5 was performed to get to root cause and corrective</p> <p>6 actions. I'm not familiar -- I do believe this was</p> <p>7 a number of years ago, so I'd have to look into</p> <p>8 that.</p> <p>9 Q. Subject to check, would you agree that the</p> <p>10 Braintree yard situation you're describing occurred</p> <p>11 in Whitman in approximately two thousand -- that it</p> <p>12 occurred in Whitman?</p> <p>13 A. [McNAMARA] Subject to check. I know it</p> <p>14 was in the Braintree division. The town escapes me.</p> <p>15 Q. Thank you. Just to wrap up the earlier</p> <p>16 question about QA/QC inspections: Are QA/QC</p> <p>17 inspections done on random services?</p> <p>18 A. [McNAMARA] QA/QC inspections would be</p> <p>19 performed on random services, yes.</p> <p>20 Q. How many random services are initiated each</p> <p>21 year in the Massachusetts service territory?</p> <p>22 A. [McNAMARA] That is not a number I'm</p> <p>23 familiar with.</p> <p>24 A. [SMITH] Could I ask you how are you're</p>
468	<p>1 the present date.</p> <p>2 A. [McNAMARA] Just to clarify for the</p> <p>3 information request: The redig program includes</p> <p>4 redigs on bargaining unit personnel as well. Are</p> <p>5 you looking for both numbers or just contractors?</p> <p>6 Q. It would be great if we could parse it out</p> <p>7 by contractor versus in-house.</p> <p>8 MS. PIEPER: That's going to be Record</p> <p>9 Request USW-19.</p> <p>10 (Record Request USW-19.)</p> <p>11 Q. Are you aware of any circumstances in which</p> <p>12 low-pressure fittings were put on high-pressure</p> <p>13 mains by contractors?</p> <p>14 A. [McNAMARA] I'm aware of a situation that</p> <p>15 occurred, I believe in our Braintree division, where</p> <p>16 that occurred, yes.</p> <p>17 Q. Is that contractor still employed as a</p> <p>18 vendor by National Grid?</p> <p>19 A. [McNAMARA] I believe that contractor</p> <p>20 company is still employed by National Grid.</p> <p>21 Q. Can you tell me the approximate date of</p> <p>22 when that occurred?</p> <p>23 A. [McNAMARA] I don't have that.</p> <p>24 Q. Can you tell me what corrective action was</p>	470	<p>1 defining random service, and then I may be able to</p> <p>2 answer that question.</p> <p>3 Q. I think we're talking about a conversion</p> <p>4 situation.</p> <p>5 A. [SMITH] So it would be a new-service</p> <p>6 installation from a customer who is converting from</p> <p>7 another fuel source to natural gas.</p> <p>8 Q. Correct.</p> <p>9 A. [SMITH] So the number varies year over</p> <p>10 year. It ranges typically between, somewhere</p> <p>11 between 4,000 and 6,000 services per year.</p> <p>12 Q. Thank you. And those are throughout your</p> <p>13 Massachusetts service territories?</p> <p>14 A. [SMITH] That would be throughout</p> <p>15 Massachusetts.</p> <p>16 Q. I want to turn your attention now, as soon</p> <p>17 as I can find it, to Page 23 and 24 of your</p> <p>18 testimony, concerning tracer wire.</p> <p>19 MS. PIEPER: Let's go off the record for</p> <p>20 a minute.</p> <p>21 (Discussion off the record.)</p> <p>22 MS. PIEPER: Let's go back on the</p> <p>23 record.</p> <p>24 Q. Thank you. We were on Page 23 and 24 of</p>

471	<p>1 your testimony concerning tracer wire. Now, the 2 company uses tracer wire on all of its plastic main 3 replacements; correct? 4 A. [McNAMARA] I wouldn't say on. It doesn't 5 belong on the pipe. But yes, it's used in 6 conjunction with putting pipe in the ground for 7 locating purposes, yes. 8 Q. Well, it's connected thereto so that your 9 equipment that your field technicians use can detect 10 metal underneath the ground and literally trace the 11 plastic piping; correct? 12 A. [McNAMARA] It's not connected to plastic 13 pipe. It's connected to itself, tracer wire, and it 14 can be connected to steel pipe. 15 Q. So tracer wire is used alongside -- would 16 you agree that tracer wire is placed alongside 17 plastic piping and then it can be used to identify 18 where the plastic pipe is by its location? 19 A. [McNAMARA] I would agree in general with 20 your statement, yes. 21 Q. I promise not to become a location 22 technician anytime soon. 23 So it's important to use the tracer 24 wire, because without it you can't locate plastic</p>	473	<p>1 Q. Has Dryconn published new instructions, 2 consistent with your testimony? 3 A. [SMITH] Our understanding in discussions 4 with Dryconn is that it will be publishing new 5 instructions and that all new packaging going 6 forward will have those instructions, and that that 7 will indicate that the Dryconn connectors may be 8 used with the stranded wire. 9 Q. But to date they have not published any new 10 instructions or advisories to customers concerning 11 the use of Dryconn connectors with stranded wire? 12 A. [SMITH] They have communicated with 13 National Grid that they agree that it is appropriate 14 to use those connectors with stranded wire. 15 Q. Have they put that in writing? 16 A. [SMITH] I will have to check as to the 17 exact nature of that communication. 18 Q. I would like to ask a record request for 19 any -- well, if it's an oral communication, then the 20 date and who that information was communicated to, 21 and if it's written communication, we'd like the 22 written communication. 23 A. [SMITH] Absolutely. 24 MS. PIEPER: That's going to be Record</p>
472	<p>1 pipe under the ground just with the equipment that 2 National Grid has? 3 A. [McNAMARA] That is the conductor to locate 4 plastic pipe, with which you would locate 5 nonmetallic pipe. 6 Q. And throughout its Massachusetts service 7 territory the company uses the brand Dryconn 8 waterproof connectors to connect the tracer wire; 9 correct? 10 A. [McNAMARA] This is my understanding, yes. 11 Q. Were you aware that Dryconn's own 12 instructions, their own -- their published 13 instructions state that connectors should only be 14 used with solid connectors? Correct? 15 A. [SMITH] The -- we're aware that the 16 packaging, the older packaging, on Dryconn did 17 indicate that it should not be used for that 18 purpose. However, what we do know after testing it 19 ourselves and in discussions with Dryconn, that that 20 was based on a misunderstanding of some of the 21 issues that were seen related to torquing during 22 installation -- that in fact the Dryconn connectors 23 themselves are perfectly appropriate and can safely 24 be used with the stranded wires.</p>	474	<p>1 Request USW-20. 2 (Record Request USW-20.) 3 Q. Did Dryconn provide the company assurances 4 that it would warranty its connectors using the 5 stranded connector that National Grid has been using 6 for as many years as it's been using it? 7 A. [SMITH] I can confirm that Dryconn has 8 told us that they agree with the results of National 9 Grid's testing, that the Dryconn connectors can be 10 used with stranded wire. 11 Q. Have they agreed that the warranty for the 12 project, for the connectors, holds even with the use 13 of stranded wire? 14 A. [SMITH] I don't know the answer to that 15 question. 16 Q. I'd like to make a record request for the 17 answer to the question has Dryconn provided 18 guarantees to the company that the warranty on its 19 connector -- excuse me, on its connector products 20 holds even with the use of stranded wire. 21 MS. PIEPER: That's going to be Record 22 Request USW-21. 23 (Record Request USW-21.) 24 Q. Moving to Page 26 of your testimony,</p>

475	<p>1 concerning 599 Commercial Street in Weymouth, and 2 the events of November 16th, 2017: First, can you 3 define what a critical main is? 4 A. [McNAMARA] A critical main is one that 5 might feed a large segment of customers in a one-way 6 feed or to critical facilities, such as nursing 7 homes, hospitals -- generally larger- diameter, 8 higher-pressure facilities. 9 Q. What pressure do critical mains normally 10 operate at, if there's a band or a continuum? 11 A. [McNAMARA] Generally, critical mains would 12 be 25 psi and above. 13 Q. And would you regard that as high-pressure? 14 A. [McNAMARA] Medium to high, yeah. 15 Q. And the main at 599 Commercial Street in 16 Weymouth, was that a critical main? 17 A. [McNAMARA] That is my understanding. 18 Q. And it operated at approximately 137 psi; 19 correct? 20 A. [McNAMARA] That's my understanding. 21 Q. Thank you. If a worker or equipment were 22 to accidentally breach -- if it were to accidentally 23 breach a critical main, what would happen? 24 A. [McNAMARA] I guess you'd have to define</p>	477	<p>1 in our testimony, that the company found that the 2 contractor had actually dug beyond the scope of 3 their job. And so the scope of their job was not 4 indicated on the Dig Safe ticket to include the 5 critical main. So therefore, based on what was on 6 the ticket, the company per its policies would not 7 have assigned a foreign opening inspector to that 8 job. 9 Q. What documentation does the company have 10 that the contractor went beyond the scope of the Dig 11 Safe ticket? 12 A. [SMITH] So the company would perform an 13 investigation on that. It would have the ticket 14 itself and the result of their investigation or 15 investigations. 16 Q. Has the incident assessment been produced 17 in this proceeding? 18 A. [SMITH] I do not believe it has. 19 Q. I'd like to make a record request for the 20 incident assessment or the incident investigation 21 that occurred at 599 Commercial Street in Weymouth 22 on November 17th, 2017. 23 MS. PIEPER: That's going to be Record 24 Request USW-22.</p>
476	<p>1 "breach" for me. 2 Q. If there were a break, if there were -- 3 A. [McNAMARA] If it was struck and ruptured? 4 Q. If it ruptured the surface. 5 A. [McNAMARA] There would be a significant 6 release of gas, and it would be an extremely 7 hazardous situation. 8 Q. By "hazardous," could it be considered a 9 reportable incident by the DPU? 10 A. [McNAMARA] For the purposes of the 11 Massachusetts DPU, yes. 12 Q. When third-party contractors are performing 13 work crossing a critical main, what is the company's 14 practice regarding the assignment of -- with regard 15 to the assignment of a foreign opening inspector? 16 A. [McNAMARA] The company's procedures call 17 for the assignment of a foreign opening inspector 18 when critical facilities are to be crossed. 19 Q. Are you aware that no foreign opening 20 inspector was assigned to 599 Commercial Street 21 on -- I'm sorry, it wasn't November 16th -- November 22 17th, 2017? 23 A. [SMITH] While there was no inspector 24 assigned to that job, I do note, and it is included</p>	478	<p>1 (Record Request USW-22.) 2 Q. Now, in your testimony you stated that 3 there was no damage on the critical main; do you 4 remember that? 5 A. [McNAMARA] Yes. 6 A. [SMITH] That's correct. 7 Q. Now, in preparing this testimony, did you 8 have an opportunity to look at the timesheets of the 9 crew workers who were assigned to 599 Commercial 10 Street after the alleged near-miss -- or what you 11 say is a near-miss? 12 A. [McNAMARA] I did not review crew 13 timesheets, no. 14 Q. And are you aware that Joe Bognano and CRIS 15 Studley were both assigned on November 17th, 2017 to 16 work to repair the main's coating? 17 A. [McNAMARA] I am not personally aware of 18 that, no. 19 Q. So it's your testimony as you sit here 20 today that you did not look at their timesheets to 21 see -- 22 A. [McNAMARA] I did not. 23 Q. Do you know if the incident investigation 24 covered looking at the crew's timesheets, including</p>

479	<p>1 Mr. Bognano's and Mr. Studley's, to see what work 2 had been done on the main on November 17th, 2017? 3 A. [McNAMARA] I don't know the scope of the 4 incident review or whether it was focused on the Dig 5 Safe aspect of it or the actual damage itself. 6 Q. The timesheets of the crew would reflect 7 what type of work they were doing and why they were 8 called out to the jobsite; correct? 9 A. [McNAMARA] The timesheet would have a 10 code, but I think it would be reflected in a work 11 order what work was actually performed, not a 12 timesheet. 13 Q. So I'd like to ask both the work orders 14 that were -- I'd like to request the work orders 15 that were issued to Mr. Bognano and Mr. Studley 16 on -- 17 MS. PIEPER: Can you spell Mr. -- what 18 was the second name? 19 MS. DECTER: Mr. Bognano and 20 Mr. Studley, S-t-u-d-l-e-y -- on November 17th, 2017 21 for 599 Commercial Street. 22 MS. PIEPER: That's going to be Record 23 Request USW-23. And you understand what she's 24 asking for?</p>	481	<p>1 the need to quickly adapt to the problem over the 2 holiday weekend." Just by way of background: On 3 Page 27 and 28, what incident are you referring to? 4 A. [McNAMARA] We're referring to an incident 5 that occurred at 340 Hyde Park Avenue in Roslindale. 6 Q. Can you explain what happened at 340 Hyde 7 Park Avenue in Roslindale, just to synopsize for the 8 panel? 9 A. [McNAMARA] Sure. Company employees were 10 dispatched to a gas leak. After an investigation, 11 we were performing excavation of the cast iron gas 12 main at that location. During the excavation 13 process to uncover this gas leak gas was ignited and 14 led to a significant release of gas and fire. There 15 was an ignition. And it took multiple days to make 16 that repair. 17 Q. And what day did the explosion happen on? 18 A. [McNAMARA] It wasn't an explosion. 19 Q. I'm sorry, the fire. 20 A. [McNAMARA] It was on New Year's Eve, on 21 December 31st. 22 Q. And how long did the fire burn? 23 A. [McNAMARA] I don't have the exact hour 24 that the fire was extinguished.</p>
480	<p>1 WITNESS SMITH: I do understand what 2 she's asking for. 3 A. I just want to confirm, you're asking for 4 the work order that was issued prior to the crew 5 arriving on site and being able to assess whether or 6 not the main was damaged. 7 Q. Yes. And we'd also -- isn't it true that 8 the timesheets for individual workers state the 9 addresses of what jobs they were assigned to and the 10 number of hours worked on each job? 11 A. [McNAMARA] Address and hours would be on 12 the timesheet, correct. 13 Q. So, then, we'd like to ask for the 14 timesheets for Mr. Bognano and Mr. Studley for 15 November 17th, 2017. Thank you. 16 MS. PIEPER: So we'll amend Record 17 Request USW-23 to include the timesheets. 18 (Record Request USW-23.) 19 Q. We're nearing the end. I promise. 20 Just to assist the company: The work 21 order tickets would have been generated by a 22 supervisor named Jesus Quiles, Q-u-i-l-e-s. 23 Page 28, you both state, "The company 24 used its contractors to perform this work because of</p>	482	<p>1 Q. Subject to check, would you agree that the 2 fire was finally extinguished on January 2nd of 3 2018? 4 A. [McNAMARA] Subject to check. 5 Q. Now, December 31st through January 2nd of 6 2017/2018, respectively, those were exceedingly cold 7 days; correct? 8 A. [McNAMARA] Correct. 9 Q. Does the company have a standard operating 10 procedure with regard to staffing when it is 11 exceedingly cold out? 12 A. [McNAMARA] A standard operating procedure 13 for staffing due to cold? I'm not aware of a 14 standard operating procedure for staffing based on 15 weather. 16 Q. Is extreme cold weather associated with 17 increased gas leaks? 18 A. [McNAMARA] Extreme cold weather can have 19 an adverse impact on our gas distribution system and 20 can lead to an increased number of gas leaks. 21 Q. For the purpose of diligent planning, what 22 practices does the company follow to ensure that 23 there's adequate staffing when there's extreme cold 24 weather?</p>

483	<p>1 A. [McNAMARA] The company looks at the 2 volumes and the rates of leaks coming into the 3 company and manages that in accordance with the 4 staff they have. Should there be an increase that 5 would warrant additional staffing, we generally use 6 overtime. We can go into additional shifts, called 7 the frost plan, where we would under these adverse 8 weather conditions add additional staffing to cover 9 24 by 7. 10 Q. Is there documentation on the frost plan? 11 A. [McNAMARA] There is documentation on the 12 frost plan, yes. 13 Q. Has that been provided in this proceeding? 14 A. [McNAMARA] Not that I'm aware of. 15 A. [SMITH] I don't believe so. And just to 16 be clear, the frost plan is a plan that gets enacted 17 based on the depth of the frost in the ground, not 18 necessarily based on temperature. 19 Q. I see. Was the frost plan in place between 20 December 31st and January 2nd of the preceding year, 21 this year? 22 A. [McNAMARA] I am not aware. 23 Q. I'd like to make a record request for two 24 items. The first is the company's frost plan, and</p>	485	<p>1 though, that part of that agreement has under the 2 construction and maintenance group a whole different 3 structure for overtime and using -- there is no 4 fullest-extent-practicable language currently in use 5 in the collective bargaining agreement for 6 construction and maintenance. 7 MS. PIEPER: I just realized: The 8 reason I'm having trouble hearing you both is 9 because you're talking to each other. So if you 10 could direct your questions as if you're asking the 11 Bench the questions and if you could answer the 12 Bench the questions, then we could all hear better. 13 Thank you. 14 MS. DECTER: That's probably an 15 extremely reasonable request. I'm sorry. 16 Q. So in this case, in responding to a gas 17 leak, would construction have been called or would 18 maintenance have been called first? 19 A. [McNAMARA] For a gas leak? The first 20 responder to a gas leak is actually customer 21 metering services, so they do the -- customer 22 metering services would be the first responder, and 23 they would respond and investigate the leak to 24 determine its severity. If it needed maintenance to</p>
484	<p>1 the second is whether the company was operating 2 under the frost plan between December 31st and 3 January 2nd of this year. 4 MS. PIEPER: That's going to be Record 5 Request USW-24. 6 (Record Request USW-24.) 7 Q. You were saying before in your testimony 8 that the company routinely staffs itself using 9 overtime to make sure that it has adequate staffing; 10 correct? 11 A. [McNAMARA] Correct, and additional shifts. 12 Q. And additional shifts. And in fact, in 13 Steelworker Local 12003's contract there is an 14 intent by the company to work its unionized staff to 15 the fullest; isn't that correct? 16 A. [McNAMARA] Would you repeat the question? 17 Q. In fact, in Article 13, Section 4 of the 18 company's collective bargaining agreement with 19 Steelworkers Local 12003 there's an express intent 20 to maintain the practice of working -- of the 21 company working its unionized workforce to the 22 fullest; correct? 23 A. [McNAMARA] Yes, that language exists, and 24 I agree with your assertion. I would also say,</p>	486	<p>1 be performed, it was a verified leak that needed 2 excavation, for example, that would then be the 3 maintenance group. 4 Q. And the maintenance group is subject to 5 Article 13, Section 4, working to the fullest 6 extent; correct? 7 A. [McNAMARA] That's incorrect. 8 Q. They're subject to the construction 9 agreement that you were talking about? 10 A. [McNAMARA] The CNM agreement, yes. 11 Q. But in an emergency, isn't it true that in 12 an emergency the union has taken an all-hands-on- 13 deck approach with the company in providing labor? 14 A. [McNAMARA] I don't know what that means. 15 Q. Making all workers available whenever 16 asked. 17 A. [McNAMARA] It's been my experience that, 18 in general, when our union is contacted to provide 19 labor, especially off hours, subject to the time for 20 people to get into work, they are generally 21 responsive, yes. 22 Q. And in fact, members of Steelworkers Local 23 12003 have worked six- or seven-day weeks in 24 emergencies with some frequency; correct?</p>

487	<p>1 A. [McNAMARA] Correct. 2 Q. And they've traveled for the company to 3 respond in the company's other jurisdictions; 4 correct? 5 A. [McNAMARA] Yes, they have. 6 Q. Now, the fire burned for three days. And 7 in your testimony you said that you employed the 8 contractors to perform the work because they needed 9 to adapt over the holiday weekend. Correct? 10 A. [McNAMARA] Correct. 11 Q. But those three days included the 31st, the 12 1st, and then the 2nd; correct? 13 A. [McNAMARA] Correct. 14 Q. And the 2nd fell on a Tuesday; correct? 15 A. [McNAMARA] Correct. 16 Q. So the 2nd was not part of a holiday 17 weekend; correct? 18 A. [McNAMARA] Correct. 19 MS. DECTER: That's all I have for right 20 now. Thank you. 21 MS. PIEPER: Okay. 22 CROSS-EXAMINATION 23 BY MR. ROGERS: 24 Q. Good morning.</p>	489	<p>1 format so it can be sent to crews on the street? 2 A. [McNAMARA] I'm going to defer that to the 3 IS group. 4 Q. Do you know what software applications are 5 used by the company to provide usable information 6 for the crews? 7 A. [McNAMARA] Again, I would defer that to 8 the IS panel. 9 Q. Well, your testimony talks about something 10 called SPIPE scans records in the GIS system. Is 11 that the total extent of the information provided? 12 A. [SMITH] Those are the primary systems that 13 are used to provide information to the crews. 14 Q. Could you just list them and tell me what 15 they do? 16 A. [SMITH] Sure. So there's the Maximo work 17 order system, and that provides information on the 18 specific details of the job that's to be completed, 19 so whether it's a leak repair or another type of 20 work, a primary valve inspection or some type of 21 work that has to be performed. It has the details 22 of the job, the location, pertinent information, 23 other pertinent information that the crew would 24 need.</p>
488	<p>1 A. [McNAMARA] Good morning. 2 Q. Or should I say good afternoon. 3 So the company has an information system 4 to provide critical information to its work crews on 5 the company's gas distribution system; is that 6 correct? 7 A. [McNAMARA] Yes, I think that's accurate. 8 Q. And the information system provides work 9 order information; is that correct? 10 A. [McNAMARA] That's one bit of information 11 that would be provided by systems, yes. 12 Q. And it also provides critical distribution 13 information, including maps and pipe characteristics 14 and locations; is that correct? 15 A. [McNAMARA] That's correct. 16 Q. And the maps and pipe detail all have been 17 entered into a computer database; is that correct? 18 A. [McNAMARA] Correct. 19 Q. And the database and the computer system 20 have to be maintained and updated; is that correct? 21 A. [McNAMARA] Not my area of expertise, but I 22 would say that's fair. 23 Q. And there has to be computer software for 24 the database to convert that data into a usable</p>	490	<p>1 You have the GIS system, which is 2 providing -- that's essentially our mapping system. 3 That provides the geospatial information on the 4 location of the company's facilities. 5 We have our service pipe system, which 6 is a list of all of the services that are in the 7 system. It's an old database, essentially, that has 8 individual service card information that the crews 9 can access to get details about the services at an 10 individual address. 11 And there's the service pipes -- and 12 there's the, excuse me, scanned records, which is 13 just like what it sounds: It's a database of 14 scanned records associated with locations. 15 And then, of course, there's the other 16 one that we mention in the testimony as well, the 17 DigTrack system, which is for Dig Safe ticket 18 management. 19 Q. Now, this information has to be sent 20 through some form of communication system to the 21 trucks and vans on the street; is that correct? 22 A. [SMITH] That is correct. 23 Q. And generally, could you describe that 24 communication system -- how that gets out to the</p>

491	<p>1 crews, vehicles?</p> <p>2 A. [SMITH] I believe the IS panel would be</p> <p>3 prepared to talk to the details of that.</p> <p>4 Q. Do you know if the company has its own</p> <p>5 communication system towers, or is it done by some</p> <p>6 other means?</p> <p>7 A. [SMITH] I do not believe the company owns</p> <p>8 its own communications system towers, so it would</p> <p>9 use telecommunications vendors to provide those</p> <p>10 services.</p> <p>11 Q. So the crews receive the information on a</p> <p>12 screen in their truck or van; is that correct?</p> <p>13 A. [SMITH] For those -- yes, that would be</p> <p>14 correct.</p> <p>15 Q. And could you describe the devices in the</p> <p>16 vehicle that have this screen?</p> <p>17 A. [SMITH] So the most common device that</p> <p>18 would be in there is the Toughbook computers that we</p> <p>19 spoke about, these older, legacy devices that will</p> <p>20 be replaced by the gas business enablement project.</p> <p>21 Q. So do the Toughbooks receive the</p> <p>22 communication, like your cell phone, through the</p> <p>23 air?</p> <p>24 A. [SMITH] That is correct. And again, if I</p>	493	<p>1 crews?</p> <p>2 A. [SMITH] Again, to the best of my</p> <p>3 understanding, the devices that gas business</p> <p>4 enablement will provide would be more modern,</p> <p>5 up-to-date devices that are able to access more</p> <p>6 modern, up-to-date, faster, better, more</p> <p>7 comprehensive telecommunications networks than the</p> <p>8 older Toughbooks.</p> <p>9 Q. So you indicated earlier in the testimony</p> <p>10 that you're going from 2G to 4G; is that correct?</p> <p>11 A. [SMITH] I don't know which G they're going</p> <p>12 to. I am not a telecommunications expert. But the</p> <p>13 GBE panel is going to be up later today, and I'm</p> <p>14 sure they can provide you with the specific details</p> <p>15 on the telecommunications systems that will be used</p> <p>16 by these new devices.</p> <p>17 Q. Will the business enablement program enable</p> <p>18 you to replace the software currently used to</p> <p>19 convert the system data into usable information for</p> <p>20 the scans, maps, or SPIPE systems?</p> <p>21 A. [SMITH] I will defer that question to the</p> <p>22 GBE panel, who should be able to provide you with</p> <p>23 the details.</p> <p>24 Q. So part of the business enablement program</p>
492	<p>1 could just say: On the break one of my colleagues</p> <p>2 informed me that many of these, if not all of</p> <p>3 them -- it may be a correction to the testimony --</p> <p>4 do not run on 3G wireless but in fact run on 2G</p> <p>5 wireless.</p> <p>6 Q. Now, the company is proposing in this case</p> <p>7 to recover costs associated with its business</p> <p>8 enablement program; is that correct?</p> <p>9 A. [SMITH] That is correct.</p> <p>10 Q. And one of the claimed improvements</p> <p>11 associated with the business enablement program is</p> <p>12 field work management and GIS improvements; is that</p> <p>13 correct?</p> <p>14 A. [SMITH] That is correct.</p> <p>15 Q. To your knowledge, will the business</p> <p>16 enablement program replace the communications</p> <p>17 devices in the work crew vehicles?</p> <p>18 A. [SMITH] To the best of my knowledge, the</p> <p>19 gas business enablement will provide our field</p> <p>20 workers with new devices on which they will receive</p> <p>21 their information necessary to do their work.</p> <p>22 Q. Will the business enablement program</p> <p>23 replace the communications system used to transmit</p> <p>24 work orders and distribution information to the work</p>	494	<p>1 will be to replace the computers used to hold this</p> <p>2 information in the vans?</p> <p>3 A. [SMITH] Yes, the devices in the vans will</p> <p>4 be replaced with new devices that will be able to</p> <p>5 not only receive data, but also will be able to</p> <p>6 work, my understanding is, to work offline. And so</p> <p>7 that on those occasions when connectivity may not be</p> <p>8 available, that the devices will also be able to</p> <p>9 hold or maintain information for the crews to use.</p> <p>10 Q. Will it replace the programs that hold the</p> <p>11 database itself?</p> <p>12 A. [SMITH] Are you referring to the mainframe</p> <p>13 systems?</p> <p>14 Q. Yeah.</p> <p>15 A. [SMITH] I'm sure that my colleagues from</p> <p>16 the gas business enablement project will be able to</p> <p>17 answer that question for you.</p> <p>18 Q. Will the business enablement program</p> <p>19 replace those tasked with maintaining and updating</p> <p>20 the database that holds all the information about</p> <p>21 the company's distribution system?</p> <p>22 A. [SMITH] I'm not sure I understand your</p> <p>23 question.</p> <p>24 Q. Replace the employees or the vendors.</p>

495	<p>1 A. [SMITH] Again, I will defer that question 2 to the gas enablement panel, who can walk you 3 through what the new functionality would be. 4 Q. Now, the company tracks the activities of 5 its work crews on the company's distribution system; 6 is that correct? 7 A. [SMITH] What do you mean by "track"? 8 Q. Their time. 9 A. [McNAMARA] Yes. 10 Q. And the company does this to maintain 11 appropriate accounting of the time and costs 12 associated with each activity; is that correct? 13 A. [SMITH] That's correct. 14 Q. Could you please describe for the record 15 how the company tracks employee time. 16 A. [McNAMARA] So employees through work 17 management and the payroll entry track their time 18 and submit that to their supervisor using various 19 codes and accounts and the hours that they've worked 20 to perform that particular task to account. 21 Q. And how does the employee do that? 22 A. [McNAMARA] In our Massachusetts area that 23 is all done electronically, through the computers in 24 the truck.</p>	497	<p>1 Q. So the employee themselves determines 2 whether it's regular hours or overtime? 3 A. [McNAMARA] There are some system prompts, 4 but it's entered by an employee and approved by a 5 supervisor. 6 Q. So another important characteristic of 7 tracking employee activity is to determine whether 8 they are working on capitalizable projects or 9 operations and maintenance projects; is that 10 correct? 11 A. [McNAMARA] That's correct. 12 Q. And who or what determines whether the 13 hours being worked are booked to capitalized or 14 expensed to O&M? 15 A. [McNAMARA] The employees are provided with 16 a chart of accounts, and the work is split between 17 opex and capex based on that accounting. 18 A. [SMITH] In addition, if I could just add 19 to that as well, that certain work types 20 automatically are associated with either capital or 21 operating expense type work, so depending on which 22 work type you are charging your time to, the system 23 will determine whether those costs get booked as 24 capital or as operating expense.</p>
496	<p>1 Q. So the employee enters activity by activity 2 during the day and then it goes to the supervisor 3 for approval? 4 A. [McNAMARA] Correct. 5 Q. Are all the work crews hourly employees? 6 A. [McNAMARA] Are you speaking company 7 internal crews? 8 Q. Yeah. 9 A. [McNAMARA] All of our internal crews are 10 hourly employees. 11 Q. And one of the important accounting 12 functions is to determine whether time being spent 13 by an employee is working regular time or overtime 14 hours; is that correct? 15 A. [McNAMARA] That's correct. 16 Q. Would you describe how that's done -- that 17 is, who or what determines the hours being worked 18 are regular or overtime hours? 19 A. [McNAMARA] I believe the system is set up 20 with schedules, and the employee enters their 21 straight-time hours with certain accounting and then 22 they would enter their overtime hours with certain 23 accounting. So it's different accounts for straight 24 time versus overtime work.</p>	498	<p>1 Q. Is each activity that an employee on the 2 work crew does during the day given a work order 3 number? 4 A. [McNAMARA] That varies based on the type 5 of employee and the type of work they're doing. So, 6 for example, construction and maintenance might get 7 a particular work order for each task, whereas in 8 our customer service group their time is spread 9 across multiple tasks automatically through the 10 system. 11 Q. Will each work order by itself be 12 designated and tracked in the company's accounting 13 system as either a capital project or an O&M 14 project? 15 A. [SMITH] That is correct. 16 Q. So it's not possible, then, for a work 17 order to include cost settlements that are both 18 capital and O&M. Is that your testimony? 19 A. [SMITH] So, yes, work is either capital or 20 it's operating expense. But certain types of work, 21 to be clear, you could have a leak repair that's a 22 capital leak repair, or you could have a leak repair 23 that's an operating expense leak repair. So within 24 certain types of work it could be based on the</p>

499	<p>1 characteristics of the work, either operating 2 expense or capital. But the work order type would 3 be different that was given to the crew to charge. 4 And so the costs -- the direct costs associated with 5 that job would be clearly split between capex and 6 opex. 7 Q. So within a work order you could find 8 elements of both capital and O&M; is that correct? 9 A. [SMITH] No. Within an individual work 10 order it will either be capital or operating expense 11 given to the crew. 12 Q. Do the types of workers on a particular 13 work order activity determine whether the work order 14 is charged to capital or O&M? 15 A. [SMITH] It does not. It's the type of 16 work, not the type of worker, that determines 17 whether it is operating expense or capital. 18 Q. Do the days of the week being worked 19 determine whether work order activity is charged to 20 capital or O&M? 21 A. [SMITH] It does not. 22 Q. Do particular hours during the day being 23 worked determine whether the work order activity is 24 charged to capital or O&M?</p>	501	<p>1 submitted? 2 A. [SMITH] So measures are taken to address 3 the lag in time between when work is completed and 4 the system is updated. So during that period on our 5 maps and records there are indications of where work 6 is occurring. So while the work may not be 7 complete -- for example, a main replacement or main 8 installation job may show up on the map as a dotted 9 line, which would then be converted to a solid line 10 once the work is completed. In addition to that, 11 there are marks left in the field once a job is 12 completed that indicate where work may have 13 occurred. 14 So the good news is, with gas business 15 enablement mapping is going to occur on a much more 16 frequent basis as work is completed, that the maps 17 will be updated on a much quicker timeline that will 18 reduce that lag. But the company takes measures -- 19 and in fact, some of the simplest measures in place 20 that you can tell that work has been completed is 21 you see a trench in the ground. You can tell that 22 something was recently done there. You can see the 23 patch on the ground or the markings of the trench. 24 Q. So if a main is completed, how long does it</p>
500	<p>1 A. [SMITH] No. 2 Q. Does the fact that hours being worked by an 3 employee are overtime hours determine whether the 4 work order activity is charged to capital or O&M? 5 A. [SMITH] No. 6 MS. PIEPER: When you're at a good 7 break? 8 MR. ROGERS: Let me take a quick look. 9 We might be just about done. 10 Q. Now, in your prefiled testimony you 11 indicated that the maps and records department had a 12 main backlog that went from 104.5 miles, a cycle of 13 136 days, and now has a backlog of seven miles and a 14 cycle of 35 days. Is that correct? 15 A. [SMITH] That is correct. 16 Q. And are all the maps accurate if they've 17 been submitted more than 35 days ago? 18 A. [McNAMARA] Could you repeat the question? 19 MR. ROGERS: Alan, can you read that 20 back. 21 (Question read.) 22 A. [McNAMARA] I'm not understanding the 23 question. Sorry. 24 Q. Are all the maps up to date if they've been</p>	502	<p>1 take for the dotted line to turn into a solid line 2 in the company's system? 3 A. [SMITH] Again, we've reduced our cycle 4 times. I believe in the testimony we have that down 5 to an average of about 35 days right now. 6 Q. That's an average, though. 7 A. [SMITH] That's correct. 8 Q. What's the sort of upper end? 9 A. [SMITH] I do not know what the upper end 10 is. 11 Q. How does the company measure the accuracy 12 of its maps? 13 A. [SMITH] I just need to consult with 14 somebody in the mapping department about the 15 specific measures that are taken to -- 16 Q. Is there somebody here -- 17 A. [SMITH] There would not be somebody in the 18 room here today. 19 MR. ROGERS: Do you want to take lunch 20 and we'll come back? I think that's about all I 21 have. 22 MS. PIEPER: Let's take a lunch break. 23 Off the record. 24 (Recess for lunch.)</p>

503	<p>1 MS. PIEPER: Let's go back on the 2 record. So there were a few things for the union, 3 before the Attorney General, that you were going to 4 check on break. 5 WITNESS SMITH: First the question 6 regarding the staffing levels in the mapping 7 department. We checked, and there does not seem to 8 be that level of detail in the head-count 9 information we've provided, so we will take that as 10 a record request. 11 MS. PIEPER: So that was to get the 12 number of employees added to the mapping -- 13 MS. KIMBALL: I have it written down as 14 the number of employees in mapping in 2012, '14, 15 '16, and '18, current. 16 MS. DECTER: Correct. 17 MS. PIEPER: That's going to be Record 18 Request USW-25. 19 (Record Request USW-25.) 20 WITNESS SMITH: And then just some 21 additional followup with regard to quality checks 22 for mapping, that the Attorney General asked. So we 23 were able to confer with some mapping personnel over 24 the break.</p>	505	<p>1 records department, they immediately are scanning 2 that information and posting it to our 3 scanned-records system. And so the information is 4 available for anybody who might work at that 5 location prior to the actual information being added 6 to our GIS system. 7 MS. PIEPER: Thank you. You have no 8 more questions, or you do? 9 MS. DECTER: I have one question, just 10 about that last update. 11 FURTHER CROSS-EXAMINATION 12 BY MS. DECTER: 13 Q. When did National Grid begin the practice 14 of scanning updates to scan records? 15 A. [SMITH] I will get you the exact date. I 16 don't have the exact date available. 17 MS. DECTER: Do we need a record request 18 for that? 19 MS. PIEPER: Yes. You're looking for 20 the exact date that they began the practice of 21 scanning updates into -- 22 MS. DECTER: To contemporaneously 23 scanning updates -- or proposed updates in mapping 24 to scanned records.</p>
504	<p>1 First -- and I just want to report that 2 as of today we actually have no mapping backlog. So 3 we are making great progress in terms of that 4 backlog reduction effort. 5 And with regard to the quality check: 6 So there are two lines of defense in the quality 7 check for the mapping records. The first is that 8 all the records are turned in to a supervisor, who 9 reviews those records for accuracy, and so those 10 are -- should be reviewed prior to submitting to the 11 mapping department. 12 And the second is that our mapping 13 personnel are also required to see -- to check for 14 errors in any of the mapping or records that they 15 receive back, and if they determine there are any 16 deficiencies, they will send those records back to 17 the field to be reviewed and revised. 18 And then finally, just one additional 19 piece of information regarding the speed of mapping 20 and the quality: We've -- in the past -- I'm not 21 sure exactly when we instituted this. But what we 22 are doing in recognition of the fact that from time 23 to time there may be a backlog in mapping, as soon 24 as the information is received by our maps and</p>	506	<p>1 MS. PIEPER: It's going to be Record 2 Request USW-26. 3 (Record Request USW-26.) 4 MS. PIEPER: We have no further 5 questions. The Bench has no questions for these 6 witnesses. 7 Do you have any redirect? 8 MS. KIMBALL: No, thank you. 9 MS. PIEPER: We are done with these 10 witnesses. Thank you very much. Let's go off the 11 record and switch around. 12 (Discussion off the record.) 13 MS. PIEPER: Let's go back on the 14 record. We have some new witnesses that have not 15 been sworn in before, so if you could each state 16 your name for the record. 17 WITNESS TUFTS: I actually have been 18 sworn in last week. 19 MS. PIEPER: If you could still state 20 your name for the record. 21 WITNESS TUFTS: David E. Tufts. 22 WITNESS BUSHMICH: Pamela E. Bushmich. 23 WITNESS DANE: Daniel S. Dane. 24 DAVID E. TUFTS, PAMELA E. BUSHMICH, AND</p>

507	<p>1 DANIEL S. DANE, 2 being first duly sworn or affirmed to testify to the 3 truth, the whole truth, and nothing but the truth, 4 were examined and testified as follows: 5 MS. PIEPER: I would remind the other 6 two that you remain sworn. 7 You may proceed with direct. 8 DIRECT EXAMINATION 9 BY MS. BLACKMORE: 10 Q. I will ask a few questions to Mr. Tufts in 11 a moment. 12 Ms. Bushmich, by whom are you employed 13 and in what position? 14 A. [BUSHMICH] National Grid USA Service 15 Company, and I'm an income tax director, 16 Massachusetts jurisdiction. 17 Q. How long have you held your current 18 position? 19 A. [BUSHMICH] Current position, four years. 20 Q. Did you prepare supplemental testimony and 21 various exhibits submitted to the Department on 22 April 20th, 2018? 23 A. [BUSHMICH] I did. 24 Q. With respect to the supplemental testimony</p>	509	<p>1 A. [TUFTS] Yes. 2 MS. BLACKMORE: The witnesses are 3 available. 4 MS. PIEPER: Thank you. You may 5 proceed. 6 CROSS-EXAMINATION 7 BY MR. ROGERS: 8 Q. Good afternoon. Ms. Bushmich, are you the 9 director of income tax for the Massachusetts 10 jurisdiction? 11 A. [BUSHMICH] I am. 12 Q. Do you have responsibility for any other 13 jurisdictions? 14 A. [BUSHMICH] I do -- in some of my 15 functional responsibilities, one which is the filing 16 of the Federal consolidated return, I cover all 17 jurisdictions, and then also I'm the lead person 18 covering any tax regulatory information. 19 Q. Where? 20 A. [BUSHMICH] For all of our jurisdictions. 21 Q. So you're responsible for both gas and 22 electric operations here in Massachusetts? 23 A. [BUSHMICH] Yes, I am. 24 Q. Have you filed testimony for National Grid</p>
508	<p>1 marked as Exhibit NG-RRP-Supplemental-1, were these 2 exhibits prepared by you or under your direct 3 supervision and control? 4 A. [BUSHMICH] Yes. 5 Q. At this time do you have any changes, 6 corrections, deletions, or additions that you would 7 like to make to the testimony that you sponsored in 8 this proceeding? 9 A. [BUSHMICH] No, I don't. 10 Q. Thank you. 11 Mr. Tufts, by whom are you employed and 12 in what position? 13 A. [TUFTS] National Grid Service Company, and 14 I'm the New England director of revenue 15 requirements. 16 Q. And how long have you held your current 17 position? 18 A. [TUFTS] Six months. 19 Q. Were you involved in the preparation of 20 this rate case? 21 A. [TUFTS] Towards the final end, yes. 22 Q. But you're generally familiar with the 23 information requests that have been filed in this 24 case?</p>	510	<p>1 at the Department in Docket DPU 18-15? 2 A. [BUSHMICH] Yes, I cosponsored. 3 Q. And that docket is the Department's 4 investigation into the impact of the Tax Cuts and 5 Jobs Act of 2017 on the rates and charges of the 6 company? 7 A. [BUSHMICH] Yes. 8 Q. And in that testimony you proposed changes 9 to the base rates reconciling mechanisms of Boston 10 Gas and Colonial; is that right? 11 A. [BUSHMICH] No, we covered the changes in 12 the base rates in the supplemental filing in this 13 rate case proceeding. 14 Q. Does it include all the adjustments going 15 back to January 1, 2018? 16 A. [BUSHMICH] No, it does not include -- it 17 only begins to change the rates as of the October 1 18 date. 19 Q. Does the DPU 18-15 filing cover all those 20 costs going back to January 1, 2018? 21 A. [BUSHMICH] Yes, the company did propose a 22 treatment for those. 23 Q. And in DPU 18-15 the company provided 24 redlined tariffs to recognize the proposed changes</p>

511	<p>1 in its tariffs?</p> <p>2 A. [TUFTS] For Mass. Electric, I believe, but</p> <p>3 not for Boston and Colonial Gas.</p> <p>4 Q. Has the company provided in this case</p> <p>5 redlined tariffs to recognize the proposed changes</p> <p>6 to the tariffs that are proposed in DPU 18-15?</p> <p>7 A. [TUFTS] No.</p> <p>8 MR. ROGERS: Ms. Hearing Officer, at</p> <p>9 this time I'd like the Department to incorporate by</p> <p>10 reference for the record the National Grid filing in</p> <p>11 DPU 18-15.</p> <p>12 MS. PIEPER: Any objections to that?</p> <p>13 MS. KIMBALL: Not really, except that it</p> <p>14 incorporates electric. So we're not doing electric</p> <p>15 here. But otherwise no issue.</p> <p>16 MR. ROGERS: It's one filing, though;</p> <p>17 right?</p> <p>18 MS. KIMBALL: Yes.</p> <p>19 MS. PIEPER: And you mean the initial</p> <p>20 filing, not all the discovery and everything?</p> <p>21 MR. ROGERS: I don't think there is any</p> <p>22 discovery. But if there is....</p> <p>23 So just whatever National Grid filed and</p> <p>24 any responses to discovery.</p>	513	<p>1 A. [DANE] Okay.</p> <p>2 Q. The company plans to adjust any estimates</p> <p>3 to excess deferred income taxes after the end of</p> <p>4 2018 in a compliance filing; is that correct?</p> <p>5 A. [BUSHMICH] Yes, that's correct.</p> <p>6 Q. And any difference between the October 1st</p> <p>7 estimates and the compliance filing would be trued</p> <p>8 up in the 2019 revenue decoupling adjustment factor</p> <p>9 filing?</p> <p>10 A. [BUSHMICH] Yes.</p> <p>11 Q. Why is the revenue decoupling adjustment</p> <p>12 factor the appropriate place for this</p> <p>13 reconciliation?</p> <p>14 A. [TUFTS] I could probably answer that. I</p> <p>15 know we currently have an underrecovery in the</p> <p>16 revenue decoupling mechanism. Depending on whether</p> <p>17 or not the adjustment is significant or not -- if</p> <p>18 it's insignificant, we would propose to put it</p> <p>19 through the revenue decoupling. If it is</p> <p>20 significant, then we would propose to adjust base</p> <p>21 rates at that time, in the compliance filing.</p> <p>22 Q. Will tariff changes be required to</p> <p>23 implement your plan?</p> <p>24 A. [TUFTS] I believe so. I'm not sure. I</p>
512	<p>1 MS. PIEPER: So we're going to</p> <p>2 incorporate by reference into this docket the</p> <p>3 initial testimony of Boston Gas and Colonial Gas and</p> <p>4 any discovery responses specific to those companies.</p> <p>5 MR. ROGERS: There's one filing in</p> <p>6 18-15.</p> <p>7 MS. PIEPER: In Docket No. 18-15. And</p> <p>8 that's pursuant to 220 CMR 1.10(2).</p> <p>9 MR. ROGERS: (3)?</p> <p>10 MS. PIEPER: (3).</p> <p>11 MR. ROGERS: That's all we have for the</p> <p>12 panel, but we do have cross-examination for</p> <p>13 Mr. Dawes.</p> <p>14 MS. KIMBALL: So we can have him up as</p> <p>15 soon as these are done.</p> <p>16 MS. PIEPER: The Bench has a few</p> <p>17 questions. Let's go off the record.</p> <p>18 (Discussion off the record.)</p> <p>19 MS. PIEPER: Let's go back on the</p> <p>20 record.</p> <p>21 BENCH EXAMINATION</p> <p>22 BY MR. WAGNER:</p> <p>23 Q. Can you please refer to Exhibit NG-RRP-</p> <p>24 Supplemental-1 at 11.</p>	514	<p>1 won't commit to it, because I'm not sure. I'd have</p> <p>2 to talk to my pricing group.</p> <p>3 Q. Could I get a record request for that.</p> <p>4 MS. PIEPER: Is the pricing panel that's</p> <p>5 coming back --</p> <p>6 MS. KIMBALL: Monday.</p> <p>7 Q. We'll hold that off for the pricing panel.</p> <p>8 Could you please refer to Exhibit</p> <p>9 NG-DSD-7-COL at 1.</p> <p>10 A. [DANE] Okay.</p> <p>11 Q. If you could refer to the per-company</p> <p>12 revenue deficiency. I see it as 36,469,751.</p> <p>13 A. [DANE] Yes, per the November 15th, 2017</p> <p>14 filing.</p> <p>15 Q. Yes. How is this cell supposed to be</p> <p>16 calculated?</p> <p>17 A. [DANE] This cell represents the revenue</p> <p>18 deficiency that's calculated for Colonial Gas within</p> <p>19 the revenue requirements model, and I can give you a</p> <p>20 reference for that.</p> <p>21 Q. No, that's okay. I mean in this schedule</p> <p>22 how is that number supposed to be calculated?</p> <p>23 A. [DANE] In the Department's schedule?</p> <p>24 Q. Yes. How would you -- what formula would</p>

515	<p>1 you have with that cell?</p> <p>2 A. [DANE] I can speak generically to it. Let</p> <p>3 me just see if there's a derivation within the DPU</p> <p>4 schedules or not.</p> <p>5 MS. PIEPER: I think it would help if</p> <p>6 you actually looked at the Excel version. Can you</p> <p>7 look at the Excel version? Because I think you'll</p> <p>8 understand why we're asking this question. It's in</p> <p>9 AG-1-1.</p> <p>10 A. [DANE] I have the Excel version.</p> <p>11 Q. What formula is supposed to be in this cell</p> <p>12 to calculate the revenue deficiency?</p> <p>13 A. [DANE] The amount is -- this is the</p> <p>14 revenue deficiency before consideration of other</p> <p>15 operating revenue. So it essentially is a</p> <p>16 comparison of total revenues as reflected in the</p> <p>17 revenue requirement model with the cost of service</p> <p>18 to develop the revenue deficiency, which also</p> <p>19 reflects a gross-up for taxation.</p> <p>20 Q. Would you agree that this cell doesn't have</p> <p>21 a formula in the Excel format, that if you click on</p> <p>22 the cell, it just gives you the number?</p> <p>23 A. [DANE] That's correct. The version</p> <p>24 they've, that I assume you're working with, has just</p>	517	<p>1 tax model in Power Tax.</p> <p>2 Q. What is the status in terms of time of the</p> <p>3 project?</p> <p>4 A. [BUSHMICH] We are trying to issue that</p> <p>5 award imminently.</p> <p>6 Q. I'm going to have a couple of questions</p> <p>7 regarding the revised schedules that you provided.</p> <p>8 It's my understanding that you also provided a</p> <p>9 summary for both Boston Gas and Colonial Gas</p> <p>10 explaining all the changes in the cost of service.</p> <p>11 A. [DANE] Yes.</p> <p>12 Q. Which is very helpful for us. I need you</p> <p>13 to turn to the summary for Boston Gas and for</p> <p>14 Colonial Gas. Would you explain all the different</p> <p>15 changes to the cost of service.</p> <p>16 A. [DANE] I have it.</p> <p>17 Q. If you could turn to Column F in the Boston</p> <p>18 Gas summary. Let me know when you're there. Just</p> <p>19 for the record, this exhibit is the summary of cost</p> <p>20 of service adjustments, Page 1 of 1, and this is for</p> <p>21 Boston Gas, BOS.</p> <p>22 A. [DANE] Okay, I'm there.</p> <p>23 Q. Thank you. I see here that you have 9.8</p> <p>24 percent, and it reads "rate base change in tax</p>
516	<p>1 an inputted value.</p> <p>2 Q. Can this cell be changed in the company's</p> <p>3 next set of schedules, 1 through 9, so that the</p> <p>4 number of the output is formulaic?</p> <p>5 A. [DANE] Yes, we can do that.</p> <p>6 MS. PIEPER: And that's the set of</p> <p>7 Schedules 1 through 9 that you'll be providing on</p> <p>8 Wednesday.</p> <p>9 WITNESS DANE: To clarify: Those are</p> <p>10 DPU Schedules 1 through 9?</p> <p>11 MS. PIEPER: Yes.</p> <p>12 BY MR. DIAZ:</p> <p>13 Q. Mr. Dane, if you could turn to Page 10 of</p> <p>14 the same exhibit, which is AG-RRP-Supplemental-1,</p> <p>15 Page 10, Line 11.</p> <p>16 A. [DANE] I'm there.</p> <p>17 Q. Here you indicate that the project is</p> <p>18 currently under competitive solicitation and is</p> <p>19 expected to commence in May 2018. Are you referring</p> <p>20 here to the deferred tax module in Power Tax?</p> <p>21 A. [BUSHMICH] Yes. I'm responsible for that</p> <p>22 area. Yes, we're doing a competitive bid, and we</p> <p>23 have two different -- we have vendors with two</p> <p>24 different solutions, one which would be a deferred</p>	518	<p>1 effect."</p> <p>2 A. [DANE] Yes.</p> <p>3 Q. Now could you please turn to your revised</p> <p>4 schedules, Exhibit NG-DSD-2-BOS, which is Revision</p> <p>5 1, Schedule 1, at Page 3.</p> <p>6 A. [DANE] Okay, I'm there.</p> <p>7 Q. And what number do you show in that exhibit</p> <p>8 for the cost of capital?</p> <p>9 A. [DANE] Here we show a weighted</p> <p>10 capitalization cost of 7.54 percent, which is on</p> <p>11 Line 5, Column C. Column D has the tax effect for</p> <p>12 the return on equity. And Column E represents the</p> <p>13 addition of those two, which is 9.63 percent.</p> <p>14 Q. And why is that number different than the</p> <p>15 one that you have in the summary?</p> <p>16 A. [DANE] If I could confer with Mr. Tufts.</p> <p>17 MS. PIEPER: Go ahead. Let's go off the</p> <p>18 record while they confer.</p> <p>19 (Discussion off the record.)</p> <p>20 MS. PIEPER: Let's go back on the</p> <p>21 record.</p> <p>22 A. That 9.80 percent, which is on what we're</p> <p>23 calling the lead sheet, also reflects an amount for</p> <p>24 uncollectibles expense, which is applied in</p>

519	<p>1 calculating the overall revenue requirement in terms 2 of the incremental revenue that's represented by the 3 deficiency. So the inputs are the same as would be 4 in the schedule we were referring to, which was Page 5 3 of Schedule 1, but it has that additional portion 6 of the formula. 7 Q. And the same calculation applies to 8 Colonial Gas? 9 A. [DANE] I don't have that formula in front 10 of me, but subject to check, I would say that. 11 Q. Well, I have in front of me Exhibit 12 NG-DSD-2-Colonial, Schedule 1, Page 3, cost of 13 capital. I see a return, pretax return, of 9.80. 14 And that number just happens to be exactly the 15 number that you had as a return for Boston Gas. So 16 I was just wondering if you might have transposed 17 the numbers -- because if the bad debt applies to 18 Colonial, there should be a difference still. So if 19 you can double-check that that's not the case. 20 A. [DANE] I will double-check. The cost of 21 debt is different between the two companies, so I do 22 believe it to be coincidental in this case. But if 23 I could confer. 24 MS. PIEPER: Sure. Go ahead.</p>	521	<p>1 DPU-8. 2 (Record Request DPU-8.) 3 Q. Now, under Column E, the uncollectible 4 charge for both, for Boston and for Colonial -- kind 5 of the same question. I notice that the number that 6 you have here is slightly different than the number 7 that you show for bad debt under revised schedules. 8 Is there any reason for that? 9 A. [DANE] If I could confer for a minute. 10 MS. PIEPER: Sure, go ahead. 11 A. [DANE] The inputs are the same as appear 12 in the revised schedule. And the way this schedule 13 works, it may make sense for us to also provide that 14 formula in a record request, just to explain -- 15 Q. That makes sense. 16 A. [DANE] But the inputs should be the same. 17 Q. Sure. What we're doing here is comparing 18 the summary of the revised schedules to Exhibit 19 NG-DSD-2-BOS, Schedule 22, and, of course, Schedule 20 22 for Colonial, which is Exhibit NG-DSD-2-COL, 21 revised one, Schedule 22. 22 MS. PIEPER: That's going to be Record 23 Request DPU-9. 24 (Record Request DPU-9.)</p>
520	<p>1 Q. So we agree that the numbers on the cost of 2 capital in the revised schedules do not agree with 3 the summary numbers for both companies? 4 A. [DANE] The numbers on the lead sheet are 5 different for both companies, as they are in the 6 revenue requirement; and the driver of that would be 7 differences in the cost of debt as well as there may 8 be slight differences in the uncollectible factor 9 that's being applied on the lead sheet to both 10 companies. 11 Q. Could you provide that as a record request, 12 explaining how you calculate that number? 13 A. [DANE] Yes. 14 Q. That would be helpful. 15 MS. PIEPER: I just want to make sure I 16 have the exhibits in here so we know what we're 17 talking about. For both companies it's Exhibit 18 NG-DSD-2-BOS or -COL, and it's Schedule 1, Page 3. 19 And it's comparing that to the lead sheets. And if 20 you could provide an explanation for the difference 21 in those rates of returns and the calculation. 22 WITNESS DANE: We'll provide the 23 calculation. I think that should reconcile the two. 24 MS. PIEPER: So that's Record Request</p>	522	<p>1 Q. One more question on this summary, and that 2 would be Letter J, and I'm looking at the working- 3 capital percentage, this time with Boston Gas. 4 Would you agree with me that that's 10.44 percent? 5 A. [DANE] Yes, as per the top of that 6 schedule under Column J. 7 Q. And now I'm comparing that number to 8 Exhibit NG-DSD-5, Boston Gas, Revision 1, Page 1 of 9 23, so Line 1 of Page 1 of 23. Are you there? 10 A. [DANE] I am, yes. 11 Q. So the two numbers are the same, aren't 12 they, the 10.24 in your summary and.... 13 A. [DANE] My apologies. I have the original. 14 Let me get to my revised version. 15 Q. Sure. 16 A. [DANE] Yes, that's the same number. 17 Q. The only question I have for you here: 18 Then I go to the schedules, like for Boston Gas, and 19 specifically Schedule 6, which shows the cash 20 working capital, and that will be Exhibit NG-DSD-7, 21 Boston Gas. 22 Now, looking at this schedule, I see a 23 composite rate of 10.68. So I'm trying to reconcile 24 the 2.44 with the 10.68. Is there any reason for</p>

523	<p>1 the difference?</p> <p>2 A. [DANE] I know that the adjustments we made</p> <p>3 between the initial filing and the revision as it</p> <p>4 related to cash working capital were to the amount</p> <p>5 of operations and maintenance expense that flowed</p> <p>6 through to the calculations. So that's my initial</p> <p>7 thought.</p> <p>8 Q. Would it be helpful to include this</p> <p>9 calculation together with the other calculations</p> <p>10 that you provide for me in a record request, how you</p> <p>11 provide for the number -- or why there's a</p> <p>12 discrepancy?</p> <p>13 A. [DANE] Yes, why don't we do that.</p> <p>14 Q. For both Boston Gas and for Colonial?</p> <p>15 MS. PIEPER: I want to make sure I have</p> <p>16 the exhibit right. We're looking at Exhibit</p> <p>17 NG-DSD-5 and comparing that to the lead sheet. And</p> <p>18 you'll provide that calculation for cash working</p> <p>19 capital?</p> <p>20 WITNESS DANE: Yes, we'll provide a</p> <p>21 description of --</p> <p>22 Q. Why the number is different than the</p> <p>23 Department Schedules 1 through 9.</p> <p>24 A. [DANE] Yes, we'll reconcile those two.</p>	525	<p>1 the following six months or so, we do the repair</p> <p>2 study and we calculate the actual tax depreciation.</p> <p>3 So we would not know what the final book and tax</p> <p>4 difference for plant is until that time.</p> <p>5 Q. Okay. I think the rest of my questions</p> <p>6 will be for the panel. On Page 9 of what's been</p> <p>7 marked as Exhibit NG-RRP-Supplemental-1, there's --</p> <p>8 Actually, let me go to Page 12. I think</p> <p>9 that will make more sense. There's a reference to</p> <p>10 passing back the excess deferred taxes associated</p> <p>11 with protected reserves over a period of 50 years,</p> <p>12 and I was interested in the reason for the selection</p> <p>13 of that particular number versus some other number.</p> <p>14 A. [BUSHMICH] Yes. First, the company's</p> <p>15 first priority is to make sure that we don't hit a</p> <p>16 normalization violation on protected. Because we</p> <p>17 will not know how much protected is or how it will</p> <p>18 reverse until we do the study, the 50-year life</p> <p>19 seemed to be a conservative estimate, so that we</p> <p>20 would not hit the normalization violation. It also</p> <p>21 happens to approximate the book life of mains, which</p> <p>22 is where we have most of our dollars.</p> <p>23 Q. And what would happen if the company had a</p> <p>24 violation of the IRS's normalization rules?</p>
524	<p>1 MS. PIEPER: And I think I should have</p> <p>2 said DSD-7, not 5.</p> <p>3 That's going to be Record Request</p> <p>4 DPU-10.</p> <p>5 (Record Request DPU-10.)</p> <p>6 MS. PIEPER: Does that make sense?</p> <p>7 WITNESS DANE: Yes.</p> <p>8 BY MR. OSBORNE:</p> <p>9 Q. I have just several followup questions.</p> <p>10 The first one, for Ms. Bushmich, following up to Mr.</p> <p>11 Diaz's questioning on the deferred tax module. If</p> <p>12 National Grid was to approve the vendor, say, today</p> <p>13 or tomorrow, how long would it take to implement the</p> <p>14 solution?</p> <p>15 A. [BUSHMICH] We believe the project would</p> <p>16 take at least three months. Also, the final numbers</p> <p>17 cannot be arrived at until we file our Federal</p> <p>18 income tax return for the period ending March 2018.</p> <p>19 Q. And the reason why you would have to wait</p> <p>20 until the Federal income tax return is what?</p> <p>21 A. [BUSHMICH] Because our plant work -- when</p> <p>22 we do the provision, our plant work, meaning tax</p> <p>23 depreciation, bonus depreciation, repairs, are all</p> <p>24 estimates at the time of the provision. And during</p>	526	<p>1 A. [BUSHMICH] The penalty for normalization</p> <p>2 violation is the company would not be allowed to</p> <p>3 take accelerated depreciation, would be placed on a</p> <p>4 booked-straight-line method, and also any difference</p> <p>5 between what the company returned to customers --</p> <p>6 what the company returned to customers too quickly</p> <p>7 would have to be taken in as taxable income</p> <p>8 immediately.</p> <p>9 Q. Now, for the unprotected reserves, the</p> <p>10 company is proposing to pass those excess deferred</p> <p>11 taxes back over a period of 20 years for Boston Gas</p> <p>12 and 24 years for Colonial Gas.</p> <p>13 A. [BUSHMICH] Correct.</p> <p>14 Q. And that's because those correspond</p> <p>15 approximately to the life of the plant; is that</p> <p>16 correct?</p> <p>17 A. [BUSHMICH] So what we did for those, to</p> <p>18 estimate those years, was took -- we took the</p> <p>19 remaining net book value of plant per -- as of</p> <p>20 December 2017, divided it by a year's worth of book</p> <p>21 depreciation, to approximate the average remaining</p> <p>22 book life.</p> <p>23 Q. That answered my next question I had, which</p> <p>24 was going to be my last one, so I have no further</p>

527	<p>1 questions.</p> <p>2 MS. PIEPER: Thank you. I just have one</p> <p>3 question for the company. You had emailed a week</p> <p>4 ago everyone an exhibit. Do you want this marked as</p> <p>5 an exhibit?</p> <p>6 MS. KIMBALL: Yes, we do.</p> <p>7 MS. PIEPER: Let's mark it as Exhibit</p> <p>8 NG-1.</p> <p>9 (Exhibit NG-1 marked for</p> <p>10 identification.)</p> <p>11 MS. PIEPER: It was sent to the service</p> <p>12 list, so everyone should have a copy of it.</p> <p>13 MR. ROGERS: Just one more followup.</p> <p>14 FURTHER CROSS-EXAMINATION</p> <p>15 BY MR. ROGERS:</p> <p>16 Q. Ms. Bushmich, you talked about a</p> <p>17 normalization violation. Would what you said be</p> <p>18 true if it was just like a dollar, or is there a</p> <p>19 specific amount that you need -- a threshold?</p> <p>20 A. [BUSHMICH] Our advisers -- we had asked</p> <p>21 that question before, when we were adding proration</p> <p>22 to our calculations, and the proration calculations</p> <p>23 ended up being very small. And we had said to</p> <p>24 outside legal counsel, "Do we have to do this,</p>	529	<p>1 Attorney General's surrebuttal just only on tax</p> <p>2 issues.</p> <p>3 MS. PIEPER: You made an arrangement</p> <p>4 without letting the hearing officer know?</p> <p>5 MS. KIMBALL: We emailed it to you, and</p> <p>6 you had us --</p> <p>7 MS. PIEPER: Is this part of the</p> <p>8 schedule?</p> <p>9 MS. KIMBALL: Yes, this was part of the</p> <p>10 schedule change. I think it was the last element on</p> <p>11 that arrangement.</p> <p>12 MS. PIEPER: I don't recall it.</p> <p>13 MS. KIMBALL: Dan's not here.</p> <p>14 MS. PIEPER: No, I do see.</p> <p>15 MS. KIMBALL: All we wanted to do was</p> <p>16 just have her walk through this schedule. That's</p> <p>17 it. I have no redirect, that's it.</p> <p>18 MS. PIEPER: Proceed.</p> <p>19 WITNESS BUSHMICH: I developed this</p> <p>20 schedule as a result of Mr. Effron's surrebuttal</p> <p>21 testimony.</p> <p>22 MS. PIEPER: Just to be clear, it's the</p> <p>23 one I just marked as Exhibit NG-1.</p> <p>24 WITNESS BUSHMICH: Yes.</p>
528	<p>1 because the number is so small?" And their response</p> <p>2 was there was no materiality for normalization</p> <p>3 violation.</p> <p>4 Q. Is it reversible? Could you go back and</p> <p>5 correct it?</p> <p>6 A. [BUSHMICH] I wouldn't have experience in</p> <p>7 that. I think we're kind of going out on a limb,</p> <p>8 where we're saying if we do too much, we're going to</p> <p>9 correct it in the RDM, and that's what we would</p> <p>10 propose to the IRS, that we corrected it as soon as</p> <p>11 possible.</p> <p>12 Q. But is it possible to correct it; is that</p> <p>13 right?</p> <p>14 A. [BUSHMICH] I don't know.</p> <p>15 MR. ROGERS: That's it. That's all I</p> <p>16 have.</p> <p>17 MS. PIEPER: We're all set. We have no</p> <p>18 further questions for these witnesses. Do you have</p> <p>19 any redirect?</p> <p>20 MS. KIMBALL: I do. So we had an</p> <p>21 arrangement on the testimony with the Attorney</p> <p>22 General's Office that because they were doing tax</p> <p>23 testimony for the first time and we didn't have</p> <p>24 surrebuttal, that we could do live rebuttal to the</p>	530	<p>1 So in the surrebuttal testimony Mr.</p> <p>2 Effron suggested that one of our accounts, which is</p> <p>3 our regulatory asset for merger savings, because it</p> <p>4 has a tax gross-up included, he had suggested that</p> <p>5 perhaps the amortization should be reduced, I</p> <p>6 believe it was by 1.3 million, because of the change</p> <p>7 in the tax rate.</p> <p>8 And the company had reviewed this</p> <p>9 account as part of an overall project to review all</p> <p>10 accounts when the tax law change came in. And we</p> <p>11 recognize that that account does have a tax gross-up</p> <p>12 in it.</p> <p>13 However, we've already recorded the</p> <p>14 reduction in the tax expense in our income tax</p> <p>15 regulatory liability. So the company had decided</p> <p>16 that perhaps we would leave the amortization as it</p> <p>17 stood for the merger savings account and that the</p> <p>18 return of the change in the tax rate would be</p> <p>19 covered when we returned the excess deferred taxes</p> <p>20 in the excess deferred account.</p> <p>21 And what this exhibit does is, it shows</p> <p>22 that it's the same exact number if you were to</p> <p>23 reverse -- if you were to reduce the regulatory --</p> <p>24 if you were to reduce the regulatory asset by the</p>

531	<p>1 tax rate change, and how that same number shows up 2 in the excess deferred number -- and where the lives 3 are very similar. 4 If we were to reduce the amortization on 5 the reg. asset, we would also have to have a 6 corresponding reduction in the return of excess 7 deferred taxes. 8 MS. KIMBALL: We're done on everything 9 else. 10 MS. PIEPER: Does anyone have cross on 11 this limited? 12 FURTHER CROSS-EXAMINATION 13 BY MR. ROGERS: 14 Q. So the \$144,576 you show as the revenue 15 requirement impact, that's the difference -- that's 16 created by the difference between the remaining 17 life, which is 21.42, versus the proposed 18 amortization of unprotected 24 years? 19 A. [BUSHMICH] Correct. 20 MR. ROGERS: That's it. 21 MS. PIEPER: The Bench has nothing 22 further, so we are done with these witnesses. Let's 23 go off the record and switch witnesses. Thank you 24 very much.</p>	533	<p>1 Q. Were you also a cosponsor of the 2 supplemental testimony and exhibits marked for 3 identification as Exhibit NG-RRP-Supplemental 1 in 4 this proceeding? 5 A. Yes. 6 Q. Were these exhibits prepared by you or 7 under your direct supervision and control? 8 A. Yes. 9 Q. At this time do you have any changes, 10 corrections, deletions, or additions that you wish 11 to make to the supplemental testimony at this time? 12 A. No, I do not. 13 MS. BLACKMORE: The witness is 14 available. 15 MS. PIEPER: Thank you. You may 16 proceed. 17 PETER E. DAWES AND DANIEL S. DANE, 18 being first duly sworn or affirmed to testify to the 19 truth, the whole truth, and nothing but the truth, 20 was examined and testified as follows: 21 CROSS-EXAMINATION 22 BY MS. ANDERSON: 23 Q. Good afternoon, Mr. Dawes. 24 A. [DAWES] Good afternoon.</p>
532	<p>1 (Discussion off the record.) 2 MS. PIEPER: Let's go back on the 3 record. If you could please state your name for the 4 record. 5 WITNESS DAWES: Peter E. Dawes. 6 PETER E. DAWES, 7 being first duly sworn or affirmed to testify to the 8 truth, the whole truth, and nothing but the truth, 9 were examined and testified as follows: 10 MS. PIEPER: You may proceed with 11 direct. 12 MS. BLACKMORE: Thank you. 13 DIRECT EXAMINATION 14 BY MS. BLACKMORE: 15 Q. Mr. Dawes, by whom are you employed and in 16 what position? 17 A. National Grid USA Service Company. I'm the 18 director of rate case support -- sorry, director of 19 regulatory accounting and rate case support. 20 Q. How long have you held your current 21 position? 22 A. Eight months. 23 MS. PIEPER: You will definitely need to 24 speak up.</p>	534	<p>1 Q. I'm Elizabeth Anderson. I have a few 2 questions for you. I believe that you are the 3 expert regarding the administrative and general 4 overhead costs; correct? 5 A. [DAWES] Yes. 6 Q. And National Grid had performed -- or had 7 hired someone to perform a time study to assess the 8 percentage of time employees spend on 9 construction-related A&G activities; is that 10 correct? 11 A. [DAWES] Yes. 12 Q. And the time study was performed by an 13 outside vendor named PA Consulting; is that correct? 14 A. [DAWES] Yes, it is. 15 MS. PIEPER: Can I just interrupt and 16 say, can you explain what A&G stands for? 17 WITNESS DAWES: Administrative and 18 general. 19 Q. So going forward, when I say A&G, I'm 20 speaking of administrative and general. 21 And that vendor was PA Consulting; 22 correct? 23 A. [DAWES] Correct. 24 Q. And when was PA Consulting contracted to</p>

535	<p>1 perform the study?</p> <p>2 A. [DAWES] I don't know the specific date,</p> <p>3 but they started work at the beginning of the new</p> <p>4 year, in 2018.</p> <p>5 Q. 2018?</p> <p>6 A. [DAWES] Yes.</p> <p>7 Q. And when did they provide the results of</p> <p>8 the analysis to the company?</p> <p>9 A. [DAWES] So there were various phases of</p> <p>10 the projects. So the final report was recently, in</p> <p>11 April, that it was provided to the company.</p> <p>12 Q. And what are the various phases of the</p> <p>13 project?</p> <p>14 A. [DAWES] So there were seven steps to the</p> <p>15 project. So the first step was determining the</p> <p>16 costs and cost centers that were in scope for the</p> <p>17 A&G study.</p> <p>18 The second step was to develop the study</p> <p>19 templates and the instructions for the individuals</p> <p>20 that would be completing the time study.</p> <p>21 They then distributed the templates, the</p> <p>22 instructions, and held meetings with the various</p> <p>23 parties that were filling out the time studies. It</p> <p>24 was done in three waves, and also provided training</p>	537	<p>1 920, so administrative and general salaries. And</p> <p>2 the time study covered -- I have some numbers here.</p> <p>3 If you just bear with me for a second.</p> <p>4 So there were 376 different departments</p> <p>5 that principally charged to Account 920. Of that,</p> <p>6 233 had time studies performed, and 143 had</p> <p>7 statistical analysis performed.</p> <p>8 Q. Has a copy of the PA Consulting study been</p> <p>9 provided anywhere in the record in this case?</p> <p>10 A. [DAWES] I do not believe that it has.</p> <p>11 Q. Can we make a record request for a complete</p> <p>12 copy of the consulting report provided by PA?</p> <p>13 A. [DAWES] Yes.</p> <p>14 Q. And could that include -- would that</p> <p>15 include the templates that you mentioned?</p> <p>16 A. [DAWES] Yes, that is appendices within the</p> <p>17 report, yes.</p> <p>18 Q. And would you also have copies of the</p> <p>19 company's internal analysis and findings associated</p> <p>20 with that report?</p> <p>21 A. [DAWES] I'm not sure if there is an actual</p> <p>22 document that reflects that. We can certainly check</p> <p>23 and provide it if there is one.</p> <p>24 Q. If it does exist and you could provide it,</p>
536	<p>1 as well.</p> <p>2 They provided a fair amount of support</p> <p>3 throughout the time study, because as you can</p> <p>4 imagine, a lot of questions arose during the study.</p> <p>5 Also, we needed to determine the cost</p> <p>6 centers that were better suited for analytical</p> <p>7 assessment for A&G overheads, as opposed to time</p> <p>8 studies, because certain areas, like accounts</p> <p>9 payable and payroll, really don't lend themselves to</p> <p>10 a time study.</p> <p>11 They collected the studies, did a lot of</p> <p>12 work verifying data, checking on outliers or</p> <p>13 departments where results didn't seem to fit what</p> <p>14 their expectations might have been. So there was</p> <p>15 some iterative process back with departments that</p> <p>16 did time studies.</p> <p>17 And then they quantified the results and</p> <p>18 issued the report.</p> <p>19 Q. And that was in April that the report was</p> <p>20 issued.</p> <p>21 A. [DAWES] Yes.</p> <p>22 Q. So which cost centers did they identify?</p> <p>23 A. [DAWES] So the identification was for</p> <p>24 departments that primarily charged to FERC Account</p>	538	<p>1 that would be wonderful.</p> <p>2 MS. PIEPER: That's going to be Record</p> <p>3 Request AG-9.</p> <p>4 (Record Request AG-9.)</p> <p>5 Q. Mr. Dawes, if you turn to Workpaper</p> <p>6 DSD-2-BOS, Revision 1, Page 7 of 7, and I believe</p> <p>7 there's a corresponding workpaper for Colonial.</p> <p>8 A. [DAWES] We have it.</p> <p>9 Q. Does this constitute all the workpapers,</p> <p>10 calculations, formulas, assumptions and other</p> <p>11 supporting documentation used to determine the pro</p> <p>12 forma A&G overhead cost adjustment for the companies</p> <p>13 in this case?</p> <p>14 A. [DANE] I can speak to that. This</p> <p>15 represents the workpaper as it related to the A&G</p> <p>16 adjustment for labor. There were also adjustments</p> <p>17 made to outside contractors and employee expenses</p> <p>18 that would not be reflected in this workpaper.</p> <p>19 Q. But they are -- they are reflected in the</p> <p>20 other workpapers that you've provided?</p> <p>21 A. [DANE] The calculations -- the results of</p> <p>22 the calculations are certainly in the updated</p> <p>23 revenue requirement study.</p> <p>24 A. [DAWES] And I would point out, the 7.96</p>

539	<p>1 percent, the details of that reside within the PA 2 Consulting reports, the derivation of that 3 percentage. 4 Q. So we'll have that information once we 5 receive the report. 6 A. [DAWES] Yes. 7 Q. So Mr. Dawes, you indicate in the testimony 8 that the company concurs with findings in the PA 9 study; is that correct? 10 A. [DAWES] Yes. 11 Q. And did the company accept all of the 12 findings in the study? 13 A. [DAWES] I believe that we did, yes. 14 Q. So the company didn't make any changes or 15 didn't reject any findings? 16 A. [DAWES] So the project was led by an 17 internal resource that worked hand in hand with a PA 18 Consulting team, and also there was an informal 19 steering committee that had certain National Grid 20 executives. So there was a fair amount of 21 discussion as a result of their coming in and the 22 report being put together. And I wasn't part of 23 those discussions, if there were things that weren't 24 agreed to in the report. But my understanding is</p>	541	<p>1 was done for National Grid; correct? 2 A. [DAWES] Yes. It was National Grid's 3 service company where the time study was performed. 4 Q. The National Grid USA Service Company? 5 A. [DAWES] Yes. 6 Q. Thank you. And was the study done for all 7 of the businesses in the U.S.? Did that include, in 8 addition to the service company, the Boston Gas and 9 Colonial Gas operating companies? 10 A. [DAWES] So the time study was just for 11 employees of the service company, and because their 12 costs allocate out across all of the National Grid 13 companies, Boston and Colonial would have been a 14 recipient of those costs or those A&G benefits. 15 Q. And PA Consulting did its time study based 16 on a sampling methodology; correct? 17 A. [DAWES] Well, I would say it was really 18 high coverage, because we identified all of the 19 accounts -- all of the areas that charged to Account 20 920, and then all of those areas did time studies 21 for a four-week period. 22 Q. All of those areas, all of the 23 departments -- 24 A. [DAWES] Yes, that were identified -- all</p>
540	<p>1 the results that came out of the report, the 7.96 2 percent, we agreed with those results. 3 Q. So was the PA study itself truly 4 independent if company employees were constantly 5 working on it as well as the vendor? 6 A. [DAWES] Well, we hired them for the 7 expertise in actually performing the time study. So 8 they brought in their templates and also were 9 incredibly helpful in working through the data. 10 Their experience was very helpful in determining if 11 there were areas that seemed to be outliers from 12 their experience. They also did some work in 13 benchmarking against other utilities, looking at 14 what their percentages of A&G capitalized were, to 15 make sure that our results were in line or within a 16 reasonable range of what other utilities had for 17 results. 18 So it was -- so they were obviously a 19 third party, but it was a collaborative effort 20 between National Grid and PA Consulting in 21 completing the time study -- and National Grid 22 employees obviously filled out all of the time 23 studies. 24 Q. You indicate in your testimony the study</p>	542	<p>1 of those cost centers that were identified as 2 principally charging to FERC Account 920. 3 Q. So the period of time for the study was 4 four weeks; correct? 5 A. [DAWES] Yes, in three separate waves of 6 groups doing the time study, but each one was four 7 weeks. 8 Q. So it wasn't done for a full year, it was a 9 sample of time within that year. 10 A. [DAWES] Correct. 11 Q. And would you describe what caused -- or 12 why the consultant believed that the costs being 13 capitalized were insufficient? 14 A. [DAWES] So under National Grid's existing 15 policy -- you mean prior to this A&G study? That's 16 what you're referring to? 17 Q. Correct, yes. 18 A. [DAWES] So currently, prior to the study 19 National Grid would have obviously direct charging 20 to capital, which is common. There was some use of 21 the capital clearing account for certain groups to 22 charge to capital -- so areas that worked on a 23 number of different capital projects, but it didn't 24 make sense administratively for them to try to</p>

543	<p>1 charge individually to capital projects. 2 But for the most part, the 3 administrative and general areas, the support areas 4 of the business, the support-capital-related 5 activities were not -- those costs were not being 6 part of the capitalized overheads for the company. 7 Q. And did National Grid change any of its 8 practices to prevent this from happening in the 9 future? 10 A. [DAWES] So we will continue doing -- we 11 will continue capitalizing costs under the method -- 12 Let me start again. We will continue 13 capitalizing A&G costs at the current rate until we 14 do another time study, which we would plan to do 15 every year. 16 Q. Could you just clarify for the record what 17 you mean when you say "current rate"? 18 A. [DAWES] So there's -- so the labor rate 19 that was used within the revenue requirement had -- 20 there's also benefits on top of that. So the study 21 itself had a higher percentage than the rate that 22 was used in the revenue requirement, because you 23 wouldn't use an already-loaded rate within the 24 revenue requirement or you'd be double-counting the</p>	545	<p>1 A. [DAWES] Sure. 2 Q. Could we have a record request to determine 3 whether the service company had to restate any of 4 its financial statements for 2017. 5 MS. PIEPER: And that's going to be 6 Record Request AG-10. 7 A. [DAWES] I'm pretty certain it was on a 8 prospective basis and it wasn't considered an 9 accounting change for that purpose and it was all 10 recorded in the month of March in 2018. But we will 11 verify that. 12 (Record Request AG-10.) 13 Q. When you say it was all recorded in the 14 month of March, what was recorded exactly? 15 A. [DAWES] So a credit to Account 922 for the 16 full value of the results of the study and a debit 17 to Account 107, so construction work in progress. 18 Q. Was that for all of 2017? 19 A. [DAWES] Yes, full year. 20 Q. And do you know whether the company made 21 any restatements to any of its capitalized costs in 22 any of its capital trackers as a result of the 23 study? 24 A. [DAWES] I do not believe that we did.</p>
544	<p>1 benefit. 2 So the 9.26 percent is the rate within 3 our system that we'll use to capitalize G&A 4 overheads until we do another time study in fiscal 5 year 2019. 6 Q. So the 9.26 percent will stay fixed until 7 the time of the next study. 8 A. [DAWES] Yes. 9 Q. And you have another percentage, 10 presumably. 11 A. [DAWES] Correct. 12 Q. Did National Grid apply similar adjustments 13 for 2017 to its other operating companies, including 14 Massachusetts Electric and Nantucket Electric? 15 A. [DAWES] Yes, we did, for all National Grid 16 operating companies in all jurisdictions. 17 Q. And as a result, did the service company 18 have to restate any of its financial statements for 19 2017? 20 A. [DAWES] I'm not part of the reporting 21 team, so I'm not sure. My sense is no, but that 22 would be a question that we would have to take away 23 and get an answer to. 24 Q. Could you do that, please?</p>	546	<p>1 Sorry, just to follow up on that: So 2 the piece that went to Account 107 was not pushed 3 down to the work orders at the end of March 2017, so 4 the individual capital projects were not affected by 5 it. But it was within Account 107 at a large -- at 6 one value. 7 Q. Does the company have to restate its income 8 statement and balance sheet that appear in its 2017 9 annual returns to the Department here in 10 Massachusetts? 11 A. [DAWES] I don't believe that I can answer 12 that. That would be a question for reporting, 13 again. 14 Q. Could I ask a record request for that 15 information, then? 16 A. [DAWES] Yes. My understanding is that 17 it's not a change in accounting, it's a change in 18 practice, and as a result, we would not be restating 19 any prior financial results. 20 MS. PIEPER: So whether they had to 21 provide a new 2017 annual return to the Department? 22 MS. ANDERSON: That's correct, yes. 23 MS. PIEPER: And that's going to be 24 Record Request AG-11.</p>

547	<p>1 (Record Request AG-11.)</p> <p>2 Q. Isn't it true that with the March 2018</p> <p>3 accounting adjustment that you discussed here</p> <p>4 National Grid effectively restated all the plant</p> <p>5 additions in 2017, so that they would be higher?</p> <p>6 A. [DAWES] No, the amount went into</p> <p>7 construction work in progress. It wasn't closed to</p> <p>8 plant.</p> <p>9 Q. So would you agree that as a result of the</p> <p>10 company's study and the adjustments that you made,</p> <p>11 the company's 2017 earnings were higher than they</p> <p>12 would have been without the adjustments based on the</p> <p>13 A&G cost study? Is that correct?</p> <p>14 A. [DAWES] Yes.</p> <p>15 Q. On Page 15 of your testimony you indicate</p> <p>16 that PA Consulting performed an analysis of the</p> <p>17 costs included in Accounts 920, 921, and 923;</p> <p>18 correct?</p> <p>19 A. [DAWES] Yes.</p> <p>20 Q. Would you describe again just briefly what</p> <p>21 type of costs are included in Account 920?</p> <p>22 A. [DAWES] So 920 would be, for the</p> <p>23 administrative and general area, so more back-office</p> <p>24 support, finance, legal, regulatory. There are</p>	549	<p>1 That's really all I have for details. But we could</p> <p>2 certainly provide more as to the types of costs if</p> <p>3 that was necessary -- because 921 catches a lot of</p> <p>4 nonlabor costs that are A&G-related.</p> <p>5 Q. You state on Page 16 that when the company</p> <p>6 reallocates costs in its adjustment, it only</p> <p>7 reapplies that reallocation to Accounts 920 and 921;</p> <p>8 correct?</p> <p>9 A. [DAWES] Sorry, can you tell me where that</p> <p>10 was.</p> <p>11 Q. I believe it was Page 16, I believe Lines</p> <p>12 13 to 15.</p> <p>13 A. [DAWES] One more time. I guess I'm having</p> <p>14 trouble finding it.</p> <p>15 Q. I think on the bottom of Page 16 the</p> <p>16 question says, "Please describe the results of the</p> <p>17 A&G overhead studies." Do you see that?</p> <p>18 A. [DAWES] Yes.</p> <p>19 Q. It says, "Based on the study results, PA</p> <p>20 Consulting recommended that National Grid capitalize</p> <p>21 a percentage of costs recorded in USOA Accounts 920</p> <p>22 and 921 at the regulated operating utility level."</p> <p>23 Correct?</p> <p>24 A. [DAWES] Yes.</p>
548	<p>1 three or four hundred that charge into that account</p> <p>2 for departments.</p> <p>3 But it's anything that isn't functional,</p> <p>4 like distribution or customer service, would be</p> <p>5 charged into a 920 area. And so 920 is salaries.</p> <p>6 921 is nonlabor expenses. 923 is outside services,</p> <p>7 like audit fees.</p> <p>8 Q. Would contractors and vendors be included?</p> <p>9 A. [DAWES] Yes. I believe the only amounts</p> <p>10 in 923 that we actually looked at were a portion of</p> <p>11 the audit fees associated with the work that the</p> <p>12 auditors do on plant accounting.</p> <p>13 Q. You said in Account 921 that was nonlabor</p> <p>14 expenses?</p> <p>15 A. [DAWES] Right.</p> <p>16 Q. That includes office supplies and any other</p> <p>17 types of costs? What other types of nonlabor costs</p> <p>18 would be included there?</p> <p>19 A. [DAWES] Bear with me just one second and I</p> <p>20 can tell you the broad categories.</p> <p>21 These are pretty broad categories, but</p> <p>22 materials -- this probably isn't very helpful. It's</p> <p>23 very-high-level broad categories of employee</p> <p>24 expenses, so non-salary-related employee expenses.</p>	550	<p>1 Q. So why is 923 not included in that</p> <p>2 description?</p> <p>3 A. [DAWES] So I think there is a very small</p> <p>4 amount of 923, so I think that that should say 923</p> <p>5 as well, but for a very small amount of money --</p> <p>6 because principally the study was related to</p> <p>7 Accounts 920 and 921.</p> <p>8 Q. So 923 was indeed included in the</p> <p>9 reallocation?</p> <p>10 A. [DAWES] What do you mean by</p> <p>11 "reallocation"? Sorry.</p> <p>12 Q. When you changed the allocation of the</p> <p>13 costs from operating expense to capitalization, that</p> <p>14 occurred -- some of the costs in that Account 923</p> <p>15 were changed.</p> <p>16 A. [DAWES] So some of the costs that we</p> <p>17 identified to be capitalized were in Account 923,</p> <p>18 yes. The bulk of it was 920 and 921.</p> <p>19 Q. Is there a reason it's not included in the</p> <p>20 testimony?</p> <p>21 A. [DAWES] I'm not sure. So it appears to be</p> <p>22 an oversight.</p> <p>23 Q. So it should just say 920 and 921 and 923</p> <p>24 here?</p>

<p style="text-align: right;">551</p> <p>1 A. [DAWES] Yes. 2 Q. Mr. Dawes, when the company made the 3 changes to the costs that were now to be 4 capitalized, those costs encompassed employees' 5 wages and salaries; is that correct? 6 A. [DAWES] Yes. 7 Q. And the company provides certain benefits 8 to its employees on top of the wages and salaries it 9 pays them; correct? 10 A. [DAWES] Correct. 11 Q. And that includes health care costs? 12 A. [DAWES] Yes. 13 Q. Pension and PBOPs? 14 A. [DAWES] Yes -- OPEBs, PBOPs. 15 Q. Includes employee life insurance? 16 A. [DAWES] Yes. 17 Q. As well as long-term disability? 18 A. [DAWES] Yes. 19 Q. Thrift plan benefits? 20 A. [DAWES] I believe so, yes. I'm not 21 familiar with what all the employee benefits 22 overheads are. 23 Q. Tax benefits? 24 A. [DAWES] Yes.</p>	<p style="text-align: right;">553</p> <p>1 percentage, you indicated that only includes 2 Accounts 920, 921, and 923; correct? 3 A. [DAWES] If you can bear with me for one 4 second, I can go to the actual calculation. 5 So we first determined the amounts to be 6 capitalized based on the study, which included 7 amounts in 920, 921, and a small amount in 923. So 8 that was \$73 million in total, approximately. We 9 divided that by the total A&G cost reported in 10 Accounts 920 and 921 of 792 million to derive the 11 9.26 percent. And that percentage was only applied 12 to Accounts 920 and 921 for the year end 2017 actual 13 results, which resulted in the amounts that we 14 recorded in March of 2018. 15 Q. So health care costs are in Account 926; 16 correct? 17 A. [DAWES] Yes. 18 Q. And so they wouldn't have been included in 19 the 9.26 percent that you just discussed. 20 A. [DAWES] The 73 million does include a 21 portion of benefits. 22 Q. And how is that? How does it include the 23 portion of benefits? Is benefits somehow captured 24 in Accounts 920 and 921?</p>
<p style="text-align: right;">552</p> <p>1 Q. Workers' compensation? 2 A. [DAWES] Yes. 3 Q. In what account or accounts does the 4 company include health care costs? 5 A. [DAWES] Account 926. 6 Q. So these costs are included in the 7 company's adjustment made as a result of the study? 8 A. [DAWES] So for financial reporting 9 purposes, yes; the amounts that were included in the 10 development of the revenue requirement, no. 11 A. [DANE] If I could clarify that: As 12 Mr. Dawes says, there was a direct adjustment made 13 to benefits, for example. But by virtue of changing 14 the capitalization ratio in the labor analysis, 15 which flows through benefits, then the change gets 16 captured in the benefits portion of the revenue 17 requirements as well. And that was -- Mr. Dawes 18 discussed upfront the difference between the two 19 ratios, the 9.26 and the 7.96, I believe. That's 20 the reason why those differ. So that when it rolls 21 through the revenue requirement, it reflects the 22 overall change without double-counting the amount 23 that would be recorded to, for example, benefits. 24 Q. So when the company calculated the 9.26</p>	<p style="text-align: right;">554</p> <p>1 A. [DAWES] When they did the study, they also 2 picked up the associated benefits associated with 3 the employees' time that they deemed to be 4 capitalizable. 5 Q. When you talk about the associated benefits 6 associated with the employees' time, would that have 7 picked up not just health care costs but also 8 pensions and PBOPs? 9 A. [DAWES] I believe so, yes. 10 Q. And what about employee life insurance? 11 A. [DAWES] I'm not sure if all of the 12 employee overheads -- I'm not sure if all of the 13 employee benefits that were captured within the time 14 study, but we could provide that. 15 Q. Could you please provide that? 16 A. [DAWES] Yes. 17 MS. PIEPER: Would that be included in 18 the copy of the consulting report you're providing? 19 WITNESS DAWES: I don't believe so, no. 20 Q. If you could provide exactly what benefits 21 were included in that 73 million, and also just -- 22 we walked through a list of benefits earlier in your 23 testimony. If you could just address those benefits 24 and whether or not they were included or not</p>

555	<p>1 included and why. 2 A. [DAWES] Okay. 3 Q. That would be helpful. 4 MS. PIEPER: It's going to be Record 5 Request AG-12. 6 (Record Request AG-12.) 7 MS. ANDERSON: I think that's all we 8 have. Thank you. 9 MS. PIEPER: We don't have any questions 10 for this witness. Do you have any redirect? 11 MS. KIMBALL: We do not. 12 MS. PIEPER: We are done with this 13 witness. Let's take a ten-minute break and come 14 back and we'll start with the GBE panel. 15 (Recess taken.) 16 MS. PIEPER: Let's go on the record. If 17 each of you could state your name for the record. 18 WITNESS JOHNSTON: Anthony H. Johnston. 19 WITNESS IRANI-FAMILI: Reihaneh 20 Irani-Famili. 21 ANTHONY H. JOHNSON AND REIHANEH IRANI-FAMILI, 22 being first duly sworn or affirmed to testify to the 23 truth, the whole truth, and nothing but the truth, 24 were examined and testified as follows:</p>	557	<p>1 testimony submitted to the Department on April 20th, 2 2018? 3 A. [JOHNSTON] Yes. 4 Q. With respect to your rebuttal testimony, 5 which is marked for identification as Exhibit 6 NG-GBE-Rebuttal-1, was this exhibit prepared by you 7 or under your direct supervision or control? 8 A. [JOHNSTON] Yes, it was. 9 Q. Do you have any changes, corrections, 10 deletions, or additions that you wish to make to 11 your prefiled direct testimony or to your rebuttal 12 testimony at this time? 13 A. [JOHNSTON] No. 14 Q. Have you also seen information requests 15 propounded by the Department, the Attorney General, 16 and other intervenors in this case? 17 A. [JOHNSTON] I have. 18 Q. And have you sponsored responses to a 19 number of those information requests? 20 A. [JOHNSTON] Yes, I have. 21 Q. Were those responses prepared by you or 22 under your direct supervision and control? 23 A. [JOHNSTON] They were. 24 Q. At this time do you have any changes,</p>
556	<p>1 DIRECT EXAMINATION 2 BY MS. BLACKMORE: 3 Q. I'm going to start with Mr. Johnston first. 4 Mr. Johnston, by whom are you employed and in what 5 position? 6 A. [JOHNSTON] National Grid USA Service 7 Company, the SVP of gas business enablement. 8 Q. And how long have you held your current 9 position? 10 A. [JOHNSTON] Just over two years. 11 Q. Were you involved in the preparation of 12 this rate case? 13 A. [JOHNSTON] Yes, I was. 14 Q. As part of that preparation, did you 15 prepare prefiled direct testimony as part of the gas 16 business enablement panel which was submitted to the 17 Department on November 15th, 2017? 18 A. [JOHNSTON] I did. 19 Q. With respect to your prefiled direct 20 testimony, which is marked for identification as 21 Exhibit NG-GBE-1, was this exhibit prepared by you 22 or under your direct supervision and control? 23 A. [JOHNSTON] Yes, it was. 24 Q. Did you also prepare prefiled rebuttal</p>	558	<p>1 corrections, deletions, or additions that you'd like 2 to make to any of the information-request responses 3 that you have sponsored in this proceeding? 4 A. [JOHNSTON] No, I don't. 5 Q. Thank you. Ms. Irani-Famili, by whom are 6 you employed and in what position? 7 A. [IRANI-FAMILI] National Grid USA Company. 8 I'm the vice president of business readiness and 9 design for gas business enablement. 10 Q. And how long have you held your current 11 position? 12 A. [IRANI-FAMILI] Just about two years. 13 Q. Were you also involved in the preparation 14 of the rate case? 15 A. [IRANI-FAMILI] Yes. 16 Q. And as part of that preparation did you 17 prepare the prefiled direct testimony that's marked 18 for identification as Exhibit NG-GBE-1 and the 19 rebuttal testimony marked for identification as 20 Exhibit NG-GBE-Rebuttal-1? 21 A. [IRANI-FAMILI] Yes. 22 Q. Were these exhibits prepared by you or 23 under your direct supervision and control? 24 A. [IRANI-FAMILI] Yes.</p>

559	<p>1 Q. At this time do you have any changes, 2 corrections, deletions, or additions that you would 3 like to make to your prefiled direct testimony or 4 your rebuttal testimony? 5 A. [IRANI-FAMILI] No. 6 Q. Have you also seen information requests 7 propounded by the Department, the Attorney General, 8 and other intervenors in this case? 9 A. [IRANI-FAMILI] Yes. 10 Q. And have you sponsored responses to any of 11 those information requests? 12 A. [IRANI-FAMILI] Yes. 13 Q. Were those responses prepared by you or 14 under your direct supervision and control? 15 A. [IRANI-FAMILI] Yes. 16 Q. At this time do you have any changes, 17 corrections, deletions, or additions that you would 18 like to make to any of the information-request 19 responses that you have sponsored in this 20 proceeding? 21 A. [IRANI-FAMILI] No, I don't. 22 Q. Thank you. 23 MS. BLACKMORE: The witnesses are 24 available.</p>	561	<p>1 Q. And is it fair to say that you're 2 ultimately responsible for the program and its 3 success? 4 A. [JOHNSTON] That is also true. 5 Q. I just want to refer to some of the 6 testimony you provided from other rate cases that 7 have gone forward in New York and Rhode Island. So 8 referring to what was a request we made, AG-21-5: 9 We asked for any and all testimony, affidavits, 10 exhibits, attachments, and other evidence concerning 11 the GBE program submitted in other proceedings. 12 Does that sound familiar to you? 13 A. [JOHNSTON] Yes, it does. 14 Q. And do you remember that in your response 15 one of the things you submitted was direct testimony 16 for the Rhode Island PUC proceeding, 4770? 17 A. [JOHNSTON] Yes. 18 Q. And I just wanted to ask if anything else 19 has been submitted by the company in terms of 20 testimony, exhibits, affidavits, evidence in that 21 proceeding since the time you answered that 22 question. 23 A. [JOHNSTON] I would need to check with the 24 team exactly whether we've submitted anything more.</p>
560	<p>1 MS. PIEPER: Thank you. The Attorney 2 General may proceed. 3 CROSS-EXAMINATION 4 BY MR. REPPUCCI: 5 Q. Good afternoon. My name is Tim Reppucci. 6 I'm an Assistant Attorney General, and I just have a 7 few questions for you today about the GBE program. 8 Mr. Johnston, I'd like to start with 9 you. You're here to testify about the GBE and your 10 responses to discovery; is that correct? 11 A. [JOHNSTON] That's correct. 12 Q. Just for my clarification, your title is 13 SVP, gas business enablement? 14 A. [JOHNSTON] That is correct. 15 Q. In that role you're accountable for the 16 design, development, and delivery of the GBE 17 program; is that right? 18 A. [JOHNSTON] That's correct. 19 Q. And its anticipated benefits as well? 20 A. [JOHNSTON] That is also correct. 21 Q. So in essence, would you say that you are 22 the head of the GBE program? 23 A. [JOHNSTON] In essence, I am the head of 24 the GBE program.</p>	562	<p>1 MS. KIMBALL: I believe that rebuttal 2 testimony is due -- was filed yesterday. I believe 3 it was due there. So we can update and supplement 4 that response, if you would like, with the rebuttal 5 testimony that was filed in Rhode Island. 6 MR. REPPUCCI: That would be great. And 7 I will just hold off on the record request, because 8 I also want to address New York as well. 9 MS. KIMBALL: Sure. Sounds good. 10 Q. And to clarify: As well, you submitted 11 some testimony and evidence that was submitted in 12 the New York Public Service Commission cases 17E0238 13 and 17G0239, and you provided those to us as well? 14 A. [JOHNSTON] Correct, we have. 15 Q. And do you know if there's been any other 16 evidence that's been developed since and submitted 17 by the company in that case? 18 A. [JOHNSTON] No, that case has now been 19 settled with the New York PSC. 20 Q. Thank you. So we would like to make a 21 record request to update the response to 22 AG-21-5-1 -- 23 MS. PIEPER: From the company's point of 24 view, do you want that as a record request or are</p>

563	<p>1 you just going to file a supplemental response to 2 this record request? 3 MS. KIMBALL: We'll just file the 4 supplemental. It makes it easier to find in the 5 record. 6 MR. REPUCCI: That works for us. 7 MS. PIEPER: Thank you. We'll assume 8 that's due in the five-day time frame that the 9 record-request responses are due. 10 Q. And Mr. Johnston, you've worked for 11 National Grid or one of its affiliates since 1997; 12 is that correct? 13 A. [JOHNSTON] That's correct. 14 Q. And in any of your roles at National Grid, 15 whether in the UK or here, did you work at all on 16 the U.S. Foundations Program? 17 A. [JOHNSTON] I had no direct engagement on 18 the U.S. Foundations Program. 19 Q. Did you have any role in SAP implementation 20 in the United States businesses? 21 A. [JOHNSTON] No, I have not. 22 Q. Good afternoon, Ms. Irani-Famili. You're 23 here to testify as well about the GBE program? 24 A. [IRANI-FAMILI] Yes, I am.</p>	565	<p>1 the work. 2 Q. Thank you. So I wanted to talk about your 3 role in the GBE program. You testified in your 4 direct testimony that you're responsible for 5 readiness of the business, sustainment of the 6 solution, and defining new ways of working from 7 governance to performance management for the gas 8 business. 9 A. [IRANI-FAMILI] Absolutely. 10 Q. Can we summarize that to say that your role 11 is change management in the GBE program? 12 A. [IRANI-FAMILI] Yes, that is a significant 13 part of my role, yeah. 14 Q. And essentially are you in charge of the 15 change management part? 16 A. [IRANI-FAMILI] I am in charge of change 17 management. 18 Q. Thank you. What specific types of 19 activities do you perform in your role as the change 20 management head for the GBE program? 21 A. [IRANI-FAMILI] Me personally or my team? 22 Q. You personally. 23 A. [IRANI-FAMILI] A lot of it is 24 strategizing, looking at the approaches that we have</p>
564	<p>1 Q. And just to remind us: Your title is vice 2 president, business readiness and design; is that 3 correct? 4 A. [IRANI-FAMILI] That is correct. 5 Q. You began working in that role in 2016; 6 right? 7 A. [IRANI-FAMILI] Yes, August of last -- 8 2016. 9 Q. Similar to what I discussed with 10 Mr. Johnston: You were asked to provide testimony 11 that you would have submitted in any other 12 proceedings, and that request that we made for that 13 was AG-21-4. Do you remember that request? 14 A. [IRANI-FAMILI] I would have to look at -- 15 we have not provided -- I have not provided direct 16 testimony in Rhode Island or the New York cases. 17 For Massachusetts I have, but not in the other 18 jurisdictions. 19 Q. Thanks. And just to clarify, you didn't 20 provide rebuttal testimony in Rhode Island, did you? 21 A. [IRANI-FAMILI] No. 22 Q. So you've only done any testimony or 23 evidence here in Massachusetts. 24 A. [IRANI-FAMILI] Yes. Just how we divide up</p>	566	<p>1 laid out and what has worked and what has not 2 worked; looking at how we are engaging the business 3 and how the business is responding; directly 4 interacting with my peers, the other vice 5 presidents, across the business and operations, to 6 see how the work that we're doing is landing, and 7 then directing and redirecting my team and the 8 tactics and strategies we have, to make sure we have 9 an effective way of managing the change in the 10 organization. 11 Q. What components of the GBE program will you 12 be able to testify to today? 13 A. [IRANI-FAMILI] A majority. I don't know 14 what your specific question is. I don't think I 15 understand that. 16 Q. Sure. If I ask you a question and you feel 17 it's more appropriate for Mr. Johnston, we can deal 18 with it that way. 19 A. [IRANI-FAMILI] I can pass it to him, yeah. 20 Q. Thank you so much. Just a little bit about 21 your background: You have a bachelor's and master's 22 degree in chemical engineering; is that correct? 23 A. [IRANI-FAMILI] I do. 24 Q. And you have an MBA as well?</p>

567	<p>1 A. [IRANI-FAMILI] I do. 2 Q. And you graduated from business school in 3 2011? 4 A. [IRANI-FAMILI] Yes. 5 Q. You worked for Accenture for about a year 6 after you graduated? 7 A. [IRANI-FAMILI] Two years. 8 Q. And was National Grid one of your clients 9 at the time you worked for Accenture? 10 A. [IRANI-FAMILI] No. 11 Q. And have you had any other positions or 12 consulting arrangements with National Grid in any of 13 the time since you graduated business school? 14 A. [IRANI-FAMILI] No. 15 Q. Prior to this role. 16 A. [IRANI-FAMILI] No, this role was my first 17 exposure to National Grid. 18 Q. Thank you. Mr. Johnston, would you please 19 take a look at Page 5 of your direct testimony. I'd 20 like to focus on Lines 5 through 14 of your 21 testimony on that page. 22 A. [JOHNSTON] Yes. 23 Q. To summarize your testimony, you're 24 describing prior to the GBE program implementation</p>	569	<p>1 Exhibit AG-21-8. 2 A. [JOHNSTON] Yes. 3 Q. So you see in that exhibit that our office 4 asked to you itemize and provide certain details on 5 the fewer-than-30 systems, subsystems, and 6 applications that would be in service in the U.S. 7 gas companies after GBE; correct? 8 A. [JOHNSTON] Correct. 9 Q. Would you take a look at the attachment, 10 which is labeled Attachment AG-21-8-1. 11 A. [JOHNSTON] Yes. 12 Q. This chart identifies 19 systems, 13 subsystems, and applications that will be in service 14 after GBE; is that correct? 15 A. [JOHNSTON] That is correct. 16 Q. And all 19 are anticipated to be in service 17 in Massachusetts; is that right? 18 A. [JOHNSTON] That is correct. 19 Q. In that chart some of the systems 20 identified are legacy systems that have been in 21 service prior to the GBE program. Does that sound 22 right? 23 A. [JOHNSTON] That is also correct. 24 Q. And just for clarification, the dates</p>
568	<p>1 that there are more than 100 systems, subsystems, 2 applications, databases, and spreadsheet systems 3 that have been used in the U.S. gas business. Does 4 that summarize that correctly? 5 A. [JOHNSTON] That's correct. 6 Q. And after implementation it looks like 7 you're stating that there will be less than 30 8 systems, subsystems, and applications; is that 9 correct? 10 A. [JOHNSTON] That's correct. 11 Q. So the GBE program should result in 12 something less than 30 systems to cover the more 13 than a hundred. 14 A. [JOHNSTON] Correct. 15 Q. Now, the more than 100 you discussed, 16 that's not all systems, subsystems, applications 17 throughout all of the gas businesses in the U.S., is 18 it? 19 A. [JOHNSTON] No, it is. 20 Q. It is. 21 A. [JOHNSTON] So that's enterprisewide is the 22 117. Give or take, about 55 of those are 23 Massachusetts-specific. 24 Q. Thank you. Would you mind turning to</p>	570	<p>1 provided for in-service dates in this chart are for 2 calendar year, not fiscal year; right? 3 A. [JOHNSTON] That is -- 4 No. So these are fiscal years. 5 Q. Those are fiscal years? 6 A. [JOHNSTON] In terms of the first time in 7 our plan the Maximo, Salesforce are due to go into 8 service will be in December of 2018. So that would 9 be part of fiscal '19 -- within a couple of weeks of 10 2019, but yeah. 11 Q. Thank you for clarifying. Would you turn 12 to Page 3 of this attachment. 13 A. [JOHNSTON] Yes. 14 Q. You'll see in the fourth row it says SAP is 15 the identified system. Is that correct? 16 A. [JOHNSTON] It is, correct. 17 Q. Now, SAP is one of the legacy systems that 18 will remain in place after GBE is implemented; 19 right? 20 A. [JOHNSTON] That is correct. 21 Q. And SAP is already in service at the 22 company? 23 A. [JOHNSTON] That is correct. 24 Q. So SAP is not being implemented as part of</p>

571	<p>1 the GBE program; is that right?</p> <p>2 A. [JOHNSTON] SAP is not being implemented as</p> <p>3 part of the GBE program.</p> <p>4 Q. Just for clarification, we're going to walk</p> <p>5 through this because we're trying to clarify what is</p> <p>6 and is not being implemented as part of this. Bear</p> <p>7 with me. I know it's late in the afternoon.</p> <p>8 So please turn to Page 4. And Row 4</p> <p>9 shows CRIS 3; is that correct?</p> <p>10 A. [JOHNSTON] It does.</p> <p>11 Q. Row 1. I apologize.</p> <p>12 A. [JOHNSTON] Yes.</p> <p>13 Q. And CRIS 3 is already in service at the</p> <p>14 company?</p> <p>15 A. [JOHNSTON] That's correct.</p> <p>16 Q. So CRIS 3 is not being implemented as part</p> <p>17 of the GBE program; correct?</p> <p>18 A. [JOHNSTON] That's correct.</p> <p>19 Q. Please take a look at Row 2.</p> <p>20 A. [JOHNSTON] The answer is also the same for</p> <p>21 that.</p> <p>22 Q. Just to clarify for the record, we're</p> <p>23 talking about the CSS program?</p> <p>24 A. [JOHNSTON] Yes.</p>	573	<p>1 Q. PowerPlan is in service at the company;</p> <p>2 correct?</p> <p>3 A. [JOHNSTON] Correct.</p> <p>4 Q. And it is not being implemented as part of</p> <p>5 the GBE program?</p> <p>6 A. [JOHNSTON] Correct.</p> <p>7 Q. And Row 3, where it says SOP: This is in</p> <p>8 service at the company?</p> <p>9 A. [JOHNSTON] Yes.</p> <p>10 Q. And it is not being implemented as part of</p> <p>11 the GBE program?</p> <p>12 A. [JOHNSTON] That is correct. I think the</p> <p>13 important point I guess to note for the record is</p> <p>14 whilst none of those systems are being implemented,</p> <p>15 they are a core part of an integrated solution. So</p> <p>16 there will be connections to and from these systems.</p> <p>17 But the systems are already in service and being</p> <p>18 utilized.</p> <p>19 Q. Is it true for SOP, that they're being</p> <p>20 integrated into these new systems as part of the GBE</p> <p>21 program?</p> <p>22 A. [JOHNSTON] Yes.</p> <p>23 Q. As part of the implementation with the GBE</p> <p>24 program, is SOP being changed or modified in some</p>
572	<p>1 Q. And that is already in service at the</p> <p>2 company?</p> <p>3 A. [JOHNSTON] Correct.</p> <p>4 Q. And it is not being implemented as part of</p> <p>5 the GBE program.</p> <p>6 A. [JOHNSTON] Correct.</p> <p>7 Q. Row 3, we have Dig Safe NE?</p> <p>8 A. [JOHNSTON] New England.</p> <p>9 Q. And Dig Safe New England is not being</p> <p>10 implemented as part of the GBE program?</p> <p>11 A. [JOHNSTON] This is correct.</p> <p>12 Q. And it is already in service at the</p> <p>13 company.</p> <p>14 A. [JOHNSTON] This is correct.</p> <p>15 Q. At the bottom of that page you'll see</p> <p>16 GridForce. Again, this is already in service at the</p> <p>17 company?</p> <p>18 A. [JOHNSTON] Correct.</p> <p>19 Q. And it is not being implemented as part of</p> <p>20 GBE?</p> <p>21 A. [JOHNSTON] Correct.</p> <p>22 Q. Thank you. Page 5, Row 2: Do you see</p> <p>23 where it says PowerPlan?</p> <p>24 A. [JOHNSTON] Yes.</p>	574	<p>1 way?</p> <p>2 A. [JOHNSTON] It is not being changed other</p> <p>3 than integration.</p> <p>4 MS. PIEPER: If you could just speak up</p> <p>5 a bit. It's a little hard to hear.</p> <p>6 WITNESS JOHNSTON: Sorry.</p> <p>7 MS. PIEPER: Thanks.</p> <p>8 Q. Are there any costs associated with the</p> <p>9 integration of SOP with what's happening in the GBE?</p> <p>10 A. [JOHNSTON] So as with all integration, the</p> <p>11 physical effort of doing it will have costs</p> <p>12 associated with it.</p> <p>13 Q. And by "physical effort" you mean labor</p> <p>14 costs?</p> <p>15 A. [JOHNSTON] Yes.</p> <p>16 Q. Are those labor costs being charged to the</p> <p>17 GBE program or somewhere else?</p> <p>18 A. [JOHNSTON] The GBE program.</p> <p>19 Q. What we've just discussed with SOP, that</p> <p>20 there is some integration: Of the other systems</p> <p>21 that we've discussed, which other ones are being</p> <p>22 integrated into the platform after GBE?</p> <p>23 A. [JOHNSTON] All of them.</p> <p>24 Q. All of them. Okay. And do all of them</p>

575	<p>1 have some labor costs associated with their 2 integration? 3 A. [JOHNSTON] They do. 4 Q. And all of those labor costs are being 5 charged to the GBE program? 6 A. [JOHNSTON] They're all in the GBE program. 7 Q. Thank you. I apologize. We will continue 8 our march forward. Please take a look at Row 4, 9 where it says "witness." We are back on Page 5. 10 Back on Page 5 of Attachment AG-21-8-1. 11 A. [JOHNSTON] What page? Sorry. 12 Q. It is Page 5. Also, feel free to slow me 13 down. I'm rushing because it's late in the 14 afternoon and I realize we all have a lot of 15 questions, but I do want to get this clear. 16 You see on Page 5 of this attachment -- 17 A. [JOHNSTON] Yes. 18 Q. -- in the last row it says "witness"? 19 A. [JOHNSTON] Yes. 20 Q. Again, this is in service at the company? 21 A. [JOHNSTON] Yes. 22 Q. It is not being implemented as part of the 23 GBE program? 24 A. [JOHNSTON] Correct.</p>	577	<p>1 Q. Do you happen to know an in-service date 2 for that? It says NA here on the -- 3 A. [JOHNSTON] I do not know off the top of my 4 head. 5 Q. Thank you. But it is in service; correct? 6 A. [JOHNSTON] Yes. 7 Q. And it is not being implemented as part of 8 the GBE program? 9 A. [JOHNSTON] It is not. 10 Q. Is this some program that will be 11 integrated into the GBE platforms? 12 A. [JOHNSTON] I believe it will in the final 13 phases of the program, when we move on to complex 14 construction. 15 Q. And just again to clarify: There will be 16 labor costs associated with that integration? 17 A. [JOHNSTON] There will. 18 Q. And they will be charged to the GBE 19 program. 20 A. [JOHNSTON] They will. 21 Q. I'd like to turn to the systems, 22 subsystems, and applications in this attachment that 23 we have not discussed, to confirm which are being 24 implemented as part of the GBE program.</p>
576	<p>1 Q. It will have some labor costs associated 2 with its integration into the platforms after the 3 GBE program; correct? 4 A. [JOHNSTON] I believe so. 5 Q. And those costs will be charged to the GBE 6 program? 7 A. [JOHNSTON] Yes, they will. 8 Q. Please turn to Page 6. Do you see on Row 3 9 where it says "E permits"? 10 A. [JOHNSTON] Yes. 11 Q. Again, this is already in service at the 12 company? 13 A. [JOHNSTON] Correct. 14 Q. Is it not being implemented as part of the 15 GBE program? 16 A. [JOHNSTON] Correct. 17 Q. It will have labor costs associated with 18 its integration into the GBE platforms? 19 A. [JOHNSTON] It will, and they'll be part of 20 the GBE costs. 21 Q. And our last one on this is Row 5, 22 Primavera: That is in service at the company 23 already? 24 A. [JOHNSTON] It is.</p>	578	<p>1 A. [JOHNSTON] Okay. 2 Q. Please turn to Page 1 of the attachment. 3 A. [JOHNSTON] Yes. 4 Q. IBM Maximo is being implemented as part of 5 the GBE program; correct? 6 A. [JOHNSTON] Correct. 7 Q. And IBM Maximo is intended to replace 26 8 other systems; is that correct? 9 A. [JOHNSTON] That is correct. 10 Q. And would you mind taking a look at Exhibit 11 AG-21-27. 12 A. [JOHNSTON] Yes. 13 Q. Have you had a chance to review that 14 exhibit? 15 A. [JOHNSTON] Yes. 16 Q. Thank you. In this exhibit you described 17 IBM Maximo's function as the platform in which all 18 asset management data and business process will 19 reside. Is that correct? 20 A. [JOHNSTON] Yes, and also work management. 21 Q. Thank you. 22 MS. PIEPER: Also what? 23 WITNESS JOHNSTON: Work management. 24 Q. And just to clarify: Specifically for work</p>

579	<p>1 management, it's for work planning data and business 2 processes that will reside there. Is that correct, 3 according to your answer? 4 A. [JOHNSTON] Yes. 5 Q. Thank you. So is it fair to say that IBM 6 Maximo's implementation as it's replacing 26 other 7 systems and also is taking on these pretty large 8 functions is a critical part of the GBE program? 9 A. [JOHNSTON] It's one of the foundational 10 parts, yes. 11 Q. And as we discussed earlier, IBM Maximo's 12 anticipated Massachusetts in-service date is going 13 to be fiscal year 2019, according to this chart; 14 right? 15 A. [JOHNSTON] Correct. 16 Q. Is that still true today? 17 A. [JOHNSTON] That is still true today. 18 Q. And I believe earlier you mentioned 19 something about December 2018. Is that its current 20 anticipated in-service date? 21 A. [JOHNSTON] That's the current anticipated 22 in-service date. 23 Q. And by in service in December 2018, what 24 exactly -- what functions will IBM Maximo be able to</p>	581	<p>1 A. [JOHNSTON] Got it here. 2 Q. And this is the same answer where we were 3 discussing IBM Maximo: It also discusses 4 Salesforce; is that correct? 5 A. [JOHNSTON] That is correct. 6 Q. And you describe Salesforce's function as 7 the platform in which work management, specifically 8 schedule dispatch and mobility data and business 9 process, will reside; is that correct? 10 A. [JOHNSTON] That is correct. 11 Q. You also describe Salesforce's function as 12 the platform in which all customer engagement data 13 and business process reside. Is that also correct? 14 A. [JOHNSTON] That is also correct. 15 Q. So it's fair to say that Salesforce's 16 implementation is a critical part of the GBE 17 program; right? 18 A. [JOHNSTON] This is also true. 19 Q. And in this chart the anticipated 20 Massachusetts in-service date for Salesforce is 21 2019; is that correct? 22 A. [JOHNSTON] That is correct. 23 Q. Is that similarly going to be in service in 24 December 2018?</p>
580	<p>1 perform as of December 2018, per the company's -- 2 A. [JOHNSTON] So it's going to be for 3 customer meter service employees in Massachusetts. 4 So we would see predominantly the work that they 5 complete going through the systems. So that would 6 be responding to gas leaks, changing meters, turning 7 customers on, turning customers off, collections 8 activities. It also supports -- so those short- 9 cycle work activities completed by the customer 10 meter service team. 11 Q. And those are all the functions it will be 12 able to perform in December 2018; is that correct? 13 A. [JOHNSTON] Yes. 14 Q. Thank you. Please turn back to your 15 Attachment AG-21-8-1, and turn to Page 2. 16 A. [JOHNSTON] Yes. 17 Q. And here we're discussing Salesforce; is 18 that correct? 19 A. [JOHNSTON] That is correct. 20 Q. Salesforce is intended to replace 22 other 21 systems; is that right? 22 A. [JOHNSTON] That is correct. 23 Q. And now please turn again to Exhibit 24 AG-21-27.</p>	582	<p>1 A. [JOHNSTON] Yes. So it's a critical -- 2 it's critically interlinked with Maximo. And so 3 when a customer calls into the call center to say 4 that they can smell gas, those work orders will now 5 be implemented into the Salesforce solution that 6 creates a work order in Maximo, that will then 7 create the job going out to the field through 8 dispatch and through Salesforce. So the two systems 9 go hand in hand. 10 Q. Thank you. So to clarify: Will 11 Salesforce's function also be regarding customer 12 meter service for employees? I believe that's how 13 you described it earlier. 14 A. [JOHNSTON] So, yes, it's part of 15 facilitating -- it's customer-driven work. So when 16 a customer rings into the call center, that work 17 will be created into Salesforce to create that work 18 order to go out to the field. 19 Q. Salesforce is going to have other functions 20 beyond that in the future; correct? 21 A. [JOHNSTON] Correct. 22 Q. And what's sort of the next function that 23 will be in service in Massachusetts that Salesforce 24 will be able to provide to the customers here, or</p>

583	<p>1 the employees here?</p> <p>2 A. [JOHNSTON] So the Salesforce platform has</p> <p>3 got two main objectives. The first is to be a front</p> <p>4 end for our call center reps in the call center, and</p> <p>5 the second is the mobility platform for our</p> <p>6 front-line employees in the field.</p> <p>7 So as we work through the road map, as</p> <p>8 more work types get rolled out, Salesforce will</p> <p>9 provide those work types to the field reps that are</p> <p>10 able to complete those. And then for our call</p> <p>11 center reps, they're going to be able to have more</p> <p>12 and more visibility of the work that's going on in</p> <p>13 the field, so that when a customer rings into the</p> <p>14 call center and says there's a National Grid truck</p> <p>15 in my street, what's going on, the rep will have</p> <p>16 visibility of the truck in their street, what work</p> <p>17 order they're working on, who's there, what they're</p> <p>18 doing, to be able to respond to that, and also be in</p> <p>19 a position that over time we'll be able to open up</p> <p>20 the Salesforce platform to customers so that they</p> <p>21 can see National Grid employees coming to their</p> <p>22 property, to book appointments, be able to move</p> <p>23 appointments, and ultimately be able to work with</p> <p>24 our company far easier than it is today.</p>	585	<p>1 A. [JOHNSTON] Yeah, moving into --</p> <p>2 So, I mean, the complete call center</p> <p>3 solution, including all work types, including the</p> <p>4 construction work, will be the middle of 2020.</p> <p>5 Q. Thank you. In terms of the customer-facing</p> <p>6 part of Salesforce's role, similarly, do you know</p> <p>7 when that will be fully functional?</p> <p>8 A. [JOHNSTON] If I point you to our NG</p> <p>9 Exhibit GBD-5, where we showed the road map for the</p> <p>10 program overall, you'll see in that that we're</p> <p>11 starting to build out for customer interactions</p> <p>12 through that FY '21, so in that 2020 period in the</p> <p>13 customer enablement section.</p> <p>14 Q. And just for clarification on Exhibit</p> <p>15 NG-GBE-5, you are pointing to what is a yellow</p> <p>16 triangle in customer enablement that says RI MA UNY.</p> <p>17 A. So RI is for Rhode Island. MA is being</p> <p>18 available to Massachusetts. UNY is upstate New</p> <p>19 York. NYC is New York City. And LI is Long Island.</p> <p>20 Q. Thank you. And just to clarify, I'd like</p> <p>21 to go back to IBM Maximo for a second. Similarly,</p> <p>22 is IBM Maximo being sort of rolled out in three</p> <p>23 functions? And I'll reiterate them, again, for</p> <p>24 front-line employees, second for call center, and</p>
584	<p>1 Q. So in terms of the call center rollout,</p> <p>2 from what I'm hearing, there are three sort of parts</p> <p>3 of how Salesforce is going to function: one with</p> <p>4 the front-line employees.</p> <p>5 A. [JOHNSTON] Yes.</p> <p>6 Q. Another with the call center.</p> <p>7 A. [JOHNSTON] Correct.</p> <p>8 Q. And another customer-facing; right?</p> <p>9 A. [JOHNSTON] That's correct.</p> <p>10 Q. So it sounds like the December 2018</p> <p>11 in-service date in Massachusetts for Salesforce</p> <p>12 involves the front-line employees; is that correct?</p> <p>13 A. [JOHNSTON] It's predominantly focused on</p> <p>14 front-line employees, then the start to the call</p> <p>15 center being able to implement -- to create work in</p> <p>16 the call center for employees in the field to</p> <p>17 complete for customers.</p> <p>18 Q. When will the call center be able to fully</p> <p>19 utilize Salesforce?</p> <p>20 A. [JOHNSTON] So that will probably be a</p> <p>21 12-to-18-month journey post our first</p> <p>22 implementation. So it will enhance over time.</p> <p>23 Q. So it wouldn't be until at least about</p> <p>24 December 2019; is that fair to say?</p>	586	<p>1 third for any sort of customer-facing? Or is it</p> <p>2 different than Salesforce?</p> <p>3 A. [JOHNSTON] So Maximo is an enterprise work</p> <p>4 and asset management solution used by utilities all</p> <p>5 around the world. That will be the engine behind a</p> <p>6 lot of the work that's done. And so it won't be</p> <p>7 visible to the majority of employees, call center</p> <p>8 agents, and certainly customers.</p> <p>9 And so it will be the engine running a</p> <p>10 lot of the work, but it will only be specialists</p> <p>11 within the organization that really have direct</p> <p>12 access to Maximo.</p> <p>13 Q. So we discussed earlier that IBM's first</p> <p>14 role regarding sort of the -- I apologize if I get</p> <p>15 this wrong again -- the customer meter service</p> <p>16 employees in December 2018 --</p> <p>17 When will IBM Maximo fully -- be fully</p> <p>18 functional in terms of its entire envisioned</p> <p>19 function in the company at the end of the GBE</p> <p>20 program?</p> <p>21 A. [JOHNSTON] It similarly gets phased in</p> <p>22 through the whole program, and ultimately it will</p> <p>23 be -- Maximo in its entirety will be that very final</p> <p>24 box in FY '22 in terms of supporting the complex</p>

<p style="text-align: right;">587</p> <p>1 design and estimating very -- which is being rolled 2 out to all jurisdictions concurrently right at the 3 end of the program. 4 Q. And again, when you're referring to that 5 box, you're referring to the operations CMS box in 6 Exhibit NG-GBE-5; is that correct? 7 A. [JOHNSTON] That is correct. 8 Q. And that is falling under the column FY 9 2022; correct? 10 A. [JOHNSTON] That's correct. I guess it's 11 important for me to note: This phased 12 implementation of functionality has been a very 13 deliberate strategy, to learn lessons from the past 14 to support us successfully implementing the 15 solution. 16 Q. Thank you. So I'd like to turn back to -- 17 and I promise we will not spend too much more time 18 here -- Attachment AG-21-8-1. 19 A. [JOHNSTON] Yes. 20 Q. Would you turn to Page 3 of that 21 attachment, please. 22 A. [JOHNSTON] Yes. 23 Q. Now we're back to the nine systems, 24 subsystems, and applications that are being</p>	<p style="text-align: right;">589</p> <p>1 A. [JOHNSTON] At the end of the road map, FY 2 '22. 3 Q. Also on Page 3 do you see ESRI? 4 A. [JOHNSTON] I do. 5 Q. Am I correct to understand that ESRI is 6 going to be implemented with IBM Maximo? Is that 7 right? 8 A. [JOHNSTON] That is correct. 9 Q. And ESRI here in the chart has an 10 anticipated Massachusetts in-service date of fiscal 11 year 2019. 12 A. [JOHNSTON] That's correct. 13 Q. Will it, similar to IBM Maximo, have its 14 full functionality in fiscal year 2022? 15 A. [JOHNSTON] That is correct. And I guess 16 just to -- ESRI is the mapping solution for the gas 17 business enablement program. I bring it up because 18 mapping was talked about a lot this morning. So 19 this is really about us getting onto a modern 20 mapping system to allow all of our employees to have 21 full access to maps in the field. 22 Q. That's great. Thank you. That's a good 23 clarification. 24 Would you turn -- well, we're still on</p>
<p style="text-align: right;">588</p> <p>1 implemented as part of the GBE program; is that 2 correct? I apologize. When we're looking at -- 3 I'll back up. Strike that question. 4 Take a look at Page 3, where it says the 5 data management platform. 6 A. [JOHNSTON] Yes. 7 Q. And that is a program that is being 8 implemented as part of the GBE program; right? 9 A. [JOHNSTON] That is correct. 10 Q. Again, its anticipated Massachusetts 11 in-service date will be fiscal year 2019? 12 A. [JOHNSTON] Correct. 13 Q. And is that when it's going to be fully 14 operational, or is there going to be a similar 15 rollout to what's happening with IBM Maximo and 16 Salesforce? 17 A. [JOHNSTON] The data management platform is 18 really the platform to allow us to do reporting on 19 the systems, to understand how our business is 20 running. So the reports that it produces will 21 evolve as the functionality of the solution evolves 22 over the road map. 23 Q. When do you think that will be fully 24 functional, the data management platform?</p>	<p style="text-align: right;">590</p> <p>1 Page 3, again, with Copperleaf: This is being 2 implemented as part of GBE; correct? 3 A. [JOHNSTON] That is correct. So we've got 4 a pilot version of Copperleaf that we have just 5 installed to start to sort of use some of its 6 functionality, but we're going to be embedding that 7 into the GBE solution. 8 Q. In the chart it has an anticipated 9 Massachusetts in-service date of 2019; correct? 10 A. [JOHNSTON] I'm just going to confer. That 11 feels early. 12 I think we'll be using Copperleaf 13 independently in 2019, but in terms of that 14 integration in, it's probably going to be 2020. 15 Q. Thank you. Just to clarify, you're giving 16 us the implementation dates; right? 17 A. [JOHNSTON] Correct. 18 Q. On Page 5 of this attachment do you see 19 OpenText? 20 A. [JOHNSTON] Yes. 21 Q. And OpenText is being implemented as part 22 of the GBE program? 23 A. [JOHNSTON] No, it's not. OpenText is 24 being implemented as a National Grid solution, but</p>

591	<p>1 we will then be leveraging it for document 2 management. 3 Q. Is anything related to OpenText being 4 charged to the GBE program? 5 A. [JOHNSTON] Integration into OpenText will 6 be being charged, but not the implementation of, no. 7 Q. And would that be similar to legacy 8 programs or labor costs for integration will be 9 charged to the GBE program? 10 A. [JOHNSTON] Correct. 11 Q. For OpenText? 12 A. [JOHNSTON] Yes. 13 Q. Turning to Page 6, where it says the 14 integrity management platform. Do you see that? 15 A. [JOHNSTON] Yes. 16 Q. And the integrity management platform, is 17 that being implemented as part of the GBE? 18 A. [JOHNSTON] That is being implemented as 19 part of the GBE. 20 Q. And the chart says it has an anticipated 21 Massachusetts in-service date of 2019; is that 22 correct? 23 A. [JOHNSTON] That is correct. 24 Q. And is that when the integrity management</p>	593	<p>1 anticipated Massachusetts in-service date of 2019, 2 fiscal year; is that correct? 3 A. [JOHNSTON] That's correct. 4 Q. And is that when it will have its full 5 functionality in the GBE program, or is that going 6 to be at a later date? 7 A. [JOHNSTON] I think that will evolve 8 through 2020, as we then move -- the extra, 9 additional employees move onto the platform. 10 Q. Just to clarify: We've been talking about, 11 for a while, the nine systems, subsystems, and 12 applications that are being implemented as part of 13 the GBE program. 14 A. [JOHNSTON] That's correct. 15 Q. Actually, I have a correction to that 16 because I realize we're now talking about eight, 17 because we're eliminating OpenText; is that correct? 18 A. [JOHNSTON] That's correct. 19 Q. So we have eight programs being implemented 20 as part of the GBE program in this chart. 21 A. [JOHNSTON] That's correct. 22 Q. Does that sound right? 23 A. [JOHNSTON] Yes. 24 Q. For all of those their first functionality</p>
592	<p>1 platform will have its full functionality from the 2 GBE program? 3 A. [JOHNSTON] No, that's similarly going to 4 evolve through the rest of the implementation time. 5 Q. So it would be fully functional from the 6 GBE program as of fiscal year 2022; is that correct? 7 A. [JOHNSTON] Correct. 8 Q. Also on Page 2, do you see graphical work 9 design? 10 A. [JOHNSTON] I do. 11 Q. Is that being implemented as part of the 12 GBE program? 13 A. [JOHNSTON] Yes, it is. 14 Q. The chart says that its anticipated 15 Massachusetts in-service date is 2019; correct? 16 A. [JOHNSTON] We believe it's 2021. 17 Q. 2021. Thank you. And also on Page 6 the 18 time entry program, which is based on workforce -- 19 Do you see that? 20 A. [JOHNSTON] I do. 21 Q. Is that being implemented as part of the 22 GBE program? 23 A. [JOHNSTON] Yes, it is. 24 Q. And the chart says that it has an</p>	594	<p>1 isn't going to be until December 2018 at the 2 earliest; correct? 3 A. [JOHNSTON] For Massachusetts, that is 4 correct. 5 Q. And their full functionality for all of 6 them will be at 2020 at the earliest and for many of 7 them 2022; correct? 8 A. [JOHNSTON] That is correct. 9 A. [IRANI-FAMILI] Just one point of 10 clarification to that: The work type -- so there 11 will be different work types that would get the full 12 functionality. It's that that 2021 is when all work 13 types can be done in the system. 14 So there are capabilities that they will 15 be able to fully address in 2019 and '20 and '21. 16 When we talk about completely deployed by 2020, 17 that's where all functionalities of all work types 18 are available in all of these systems. 19 Q. So to clarify: For all functionalities of 20 all work types being available, what you're saying, 21 is it 2021 or 2022? 22 A. [IRANI-FAMILI] It's FY 2022. 23 Q. If you look at the Exhibit AG-21-8, to 24 which that chart is attached --</p>

595	<p>1 Do you have that in front of you? 2 A. [JOHNSTON] Yes. 3 Q. You were asked to provide a cost breakdown 4 of each of those 19 systems in the chart. Does that 5 sound familiar? 6 A. [JOHNSTON] That's correct. 7 Q. You did not provide that; right? 8 A. [JOHNSTON] That is correct. 9 Q. But you did provide work stream costs, and 10 there is a chart there that begins with work stream 11 on the second page, begins with asset management, 12 and then has a total number. Is that correct? 13 A. [JOHNSTON] That is correct. 14 Q. I just want to clarify: Do the work stream 15 costs include a mix of costs that have software 16 costs, hardware costs, and costs for services 17 provided by contractors, consultants, and employees? 18 A. [JOHNSTON] Correct. 19 Q. So none of those work stream costs are for 20 any particular system that we identified in the 21 chart. 22 A. [JOHNSTON] No. 23 Q. So you were unable to provide a cost 24 specifically for any of the nine -- or the eight</p>	597	<p>1 Q. And you can't isolate specifically for 2 implementing Salesforce what the cost would be; 3 right? 4 A. [JOHNSTON] Correct. 5 Q. Can you isolate the costs together for both 6 IBM Maximo and Salesforce? 7 A. [JOHNSTON] So we can isolate software 8 costs, but the module costs that we've got -- the 9 way the contracts worked, we don't have the 10 breakdown of -- 11 There's a number of solutions beyond, I 12 guess, Maximo and Salesforce. They're the big 13 pieces, if you like, but then as you're tied into, 14 you've got other software that's supporting the two 15 products talking to each other that's in the middle. 16 So that's all included in the module costs. 17 So whilst we can provide license costs, 18 actually the implementation costs are all bundled 19 in. 20 Q. And all bundled in includes internal 21 National Grid labor costs; correct? 22 A. [JOHNSTON] Yes. So we can break out the 23 National Grid labor versus the consultant costs 24 versus hardware costs versus software, we can break</p>
596	<p>1 systems that are being implemented as part of the 2 GBE program; correct? 3 A. [JOHNSTON] Yeah, that's correct. And the 4 reason for that is, as part of the -- getting to the 5 point of creating the GBE solution, we did a 6 significant amount of strategic assessment work 7 upfront to develop what was required, and then we 8 went to market to get the most appropriate vendors 9 to deliver that. And as part of the contractual 10 arrangements, so that had fixed-price contracts, and 11 those contractors were developed by these work 12 streams for delivering capabilities. So we've got 13 the work stream costs, but we're unable to break 14 costs down purely by a software package, because 15 there's multiple -- 16 So implementing Maximo without 17 Salesforce is useless to us because we can't serve 18 customers. We need the two of them. So the work 19 streams included creating both parts of the handoff, 20 so we've got something we can deliver to customers. 21 Q. Just for example, from what you said, you 22 can't isolate the specific costs for implementing 23 IBM Maximo; correct? 24 A. [JOHNSTON] Correct.</p>	598	<p>1 out. 2 Q. So I just want to summarize what we said: 3 You're not able to separately track the costs for 4 each of the eight individual programs itemized in 5 that chart; right? 6 A. [JOHNSTON] That's correct. 7 Q. So I'd like to take a look at what you 8 raised before, which is Exhibit NG-GBE-5. Review 9 that for a second. I think you've already indicated 10 this, but this is essentially the road map and 11 timeline for the GBE program; right? 12 A. [JOHNSTON] That's correct. 13 Q. Would you explain what the term "minimum 14 viable product release" means as it's used in this 15 chart? 16 A. [JOHNSTON] I certainly will. So one of 17 the decisions -- 18 When you implement software solutions, 19 there's traditionally two different ways of doing 20 that. One is a waterfall method, and the second is 21 an agile method. In the waterfall method, which is 22 a sort of older-school method of developing 23 software, you gather all of the requirements 24 upfront, the solution gets built; you then test the</p>

599	<p>1 solution, and then you implement it and hope that it 2 works. 3 In the agile methodology, the 4 implementation is broken down to what we call these 5 minimum viable products, which is what's the 6 simplest solution that you can put into service, you 7 can demonstrate that it's working, and then based on 8 feedback from the users build the enhancements over 9 time, to give you all the functionality that you 10 would have got by the end, but you're doing it on an 11 incremental basis. 12 And that methodology provides a couple 13 of real benefits for us and ultimately how we 14 deliver for customers. The first is, it has much 15 greater business engagement from the people using 16 the systems much earlier on in the process, and they 17 get to see what the solution's starting to look like 18 much earlier on, so they can go, "This isn't quite 19 what I need, what I really need is this." So you're 20 able to evolve the solution to deliver what's 21 required to serve our customers. 22 So when we talk about minimum viable 23 product, it's effectively the minimum functionality 24 that our resources need to be able to get the work</p>	601	<p>1 minimum viable product release is established in 2 Rhode Island, there won't be any release in 3 Massachusetts? 4 A. [JOHNSTON] That is correct. 5 Q. So it has to be functioning in Rhode Island 6 first before it's going to be released here. 7 A. [JOHNSTON] And this was a really important 8 point, I think, of lessons learned in the past, of 9 building a solution, starting small, getting it 10 working, and then when it's working we then roll it 11 out, rather than let's turn it on everywhere and 12 keep our fingers crossed that it works. 13 Q. So you're going to turn it on in Rhode 14 Island first. 15 A. [JOHNSTON] Yes. 16 Q. And once it's working there, that's when 17 Massachusetts gets to see it. 18 A. [JOHNSTON] Exactly. 19 Q. Thank you. 20 A. [IRANI-FAMILI] Just one addition to that: 21 We have done that in Rhode Island. So Rhode Island, 22 the three capabilities that you see there -- the 23 corrosion, I&R, and the collections -- have gone 24 live, and they are that minimum viable product is in</p>
600	<p>1 done safely but not all of the functionality that 2 they would really like to be able to do the job and 3 provide services best as they possibly could. 4 Q. So in terms of that agile-style rollout for 5 software, if I'm getting that correctly, you have 6 minimum viable product release labeled here, and you 7 have something called subsequent release/enhancement 8 here. 9 A. [JOHNSTON] Correct. 10 Q. Does that mean that you don't proceed to 11 anything that is a subsequent release until you've 12 established the minimum viable product? 13 A. [JOHNSTON] And that it works, correct. 14 Q. So if you take a look at the chart, under 15 fiscal year 2018 operations/CMS, you'll see the 16 minimum viable product label for Rhode Island there. 17 Do you see that? 18 A. [JOHNSTON] I do. 19 Q. And then in the next box, also labeled 20 operations/CMS, you'll see subsequent release labels 21 for Rhode Island, Massachusetts, upstate New York, 22 New York City, and Long Island. Correct? 23 A. [JOHNSTON] That is correct. 24 Q. So are we to understand that until the</p>	602	<p>1 use right now and has been a good success. 2 So this is a concept that not only we 3 have signed off for, but we have now something under 4 our belts that we have tested in Rhode Island with 5 very good success. 6 Q. Thank you. Do you happen to know when -- 7 we'll keep talking about operations/CMS, those first 8 two categories. Do you happen to know when these 9 same functions that have been successful in Rhode 10 Island will go live in Massachusetts? 11 A. [JOHNSTON] So the plan is for those to go 12 live in December. 13 Q. December of 2018? 14 A. [JOHNSTON] Correct. 15 Q. I do have one question about the road map 16 beyond what we've talked about. Do you have any 17 contingency plans in the event that you can't meet 18 any of the scheduled release points here, if the 19 timeline goes too far? 20 A. [JOHNSTON] So implementing large systems 21 like this, with all the integration, is complex and 22 challenging. And so I have every anticipation that 23 as we go through this we will need to make some 24 schedule changes to make sure that things line up</p>

603	<p>1 and we can deliver successfully.</p> <p>2 The commitment that I have, I guess,</p> <p>3 made internally is that this is going to take five</p> <p>4 years to complete, and you can see that we start to</p> <p>5 become less -- there's less activity going on in FY</p> <p>6 '22. And so to the extent that these needed to move</p> <p>7 around because we came across some unforeseen</p> <p>8 challenges, there's always the opportunity that some</p> <p>9 of the implementation could move to FY '22.</p> <p>10 At this stage now into the program and</p> <p>11 everything that we're seeing, there's nothing to</p> <p>12 suggest that we'll go beyond that.</p> <p>13 Q. Have any schedule changes been made so far?</p> <p>14 A. [JOHNSTON] Yes, there have. So you'll see</p> <p>15 on the road map that on Rhode Island we're due to go</p> <p>16 live on 3/31/2018. Our finance colleagues were</p> <p>17 concerned with us going live on the day of year end</p> <p>18 and asked us to push it back a week. So we moved</p> <p>19 our implementation date a week to the right.</p> <p>20 Q. Any other schedule changes so far?</p> <p>21 A. [JOHNSTON] No other changes so far.</p> <p>22 Q. And do you have any plans for if the entire</p> <p>23 project goes beyond the fifth year?</p> <p>24 A. [JOHNSTON] There are no plans at this</p>	605	<p>1 Absolutely it could. What I can say is that this</p> <p>2 schedule was developed back in 2016, and here we are</p> <p>3 in the middle of 2018 and we're still on track. So</p> <p>4 we've got a very strong track record of delivery so</p> <p>5 far.</p> <p>6 Q. But it's possible that some customer</p> <p>7 enablement functions might end up pushed to fiscal</p> <p>8 year 2022; correct?</p> <p>9 A. [JOHNSTON] It's always possible that</p> <p>10 something could come up unforeseen.</p> <p>11 Q. I'd like to take a look at the business</p> <p>12 case for the GBE. So if you could put before you</p> <p>13 Attachment AG-21-15-1.</p> <p>14 A. [JOHNSTON] Yes.</p> <p>15 Q. So this is the gas business enablement</p> <p>16 program business case that was developed by</p> <p>17 Accenture; is that correct?</p> <p>18 A. [JOHNSTON] That is correct.</p> <p>19 Q. Would you turn to Page 6, please.</p> <p>20 MS. PIEPER: This is marked</p> <p>21 confidential, but I don't recall it being --</p> <p>22 confidential treatment being sought for it. But it</p> <p>23 says "confidential."</p> <p>24 MS. KIMBALL: I think that I remember</p>
604	<p>1 stage. It's not anticipated. And I think one of</p> <p>2 the benefits of this approach through the phased</p> <p>3 releases through the agile development, actually</p> <p>4 we've got a lot of flexibility and visibility to see</p> <p>5 what's going on to adjust and course-correct as we</p> <p>6 go on. That feels highly unlikely, and so we've not</p> <p>7 made any plans to go beyond the five years.</p> <p>8 Q. So I think you mentioned that fewer</p> <p>9 rollouts have been scheduled for fiscal year 2022 as</p> <p>10 shown in this road map; correct?</p> <p>11 A. [JOHNSTON] Correct.</p> <p>12 Q. And part of that is to allow flexibility so</p> <p>13 that if things do fall behind you could still meet</p> <p>14 the five years.</p> <p>15 A. [JOHNSTON] Correct.</p> <p>16 Q. So it doesn't necessarily mean that --</p> <p>17 maybe let's take a look at the customer enablements</p> <p>18 scheduled in fiscal years 2019 and 2020, for</p> <p>19 Massachusetts -- will necessarily happen there; it</p> <p>20 could be pushed out if timelines changed. Correct?</p> <p>21 A. [JOHNSTON] There's no plan to do that.</p> <p>22 But for me to sit here and say there's nothing</p> <p>23 unforeseen going to happen in this program would</p> <p>24 just be disingenuous. So could it happen?</p>	606	<p>1 that it was marked confidential because internally</p> <p>2 it was confidential at one point, but we didn't file</p> <p>3 it that way. Does that sound right, Mr. Johnston?</p> <p>4 WITNESS JOHNSTON: It does. The</p> <p>5 original document that was submitted was marked</p> <p>6 confidential before we submitted it.</p> <p>7 MS. PIEPER: But it's not. All right.</p> <p>8 A. [JOHNSTON] It's an integral part of</p> <p>9 testimony.</p> <p>10 Q. So Page 6, do you see in the last column it</p> <p>11 says investment summary?</p> <p>12 A. [JOHNSTON] Correct.</p> <p>13 Q. And under program benefits it lists the</p> <p>14 number 417 million; is that correct?</p> <p>15 A. [JOHNSTON] It does.</p> <p>16 Q. Those are the total benefits that are</p> <p>17 anticipated to accumulate through fiscal year 2031;</p> <p>18 is that correct?</p> <p>19 A. [JOHNSTON] Correct.</p> <p>20 Q. Would you please turn to Page 22 of this</p> <p>21 slide deck.</p> <p>22 A. [JOHNSTON] Yes.</p> <p>23 Q. And this slide states that the GBE program</p> <p>24 will deliver material financial benefits; is that</p>

607	<p>1 correct?</p> <p>2 A. [JOHNSTON] It does, yes.</p> <p>3 Q. And it lists the total annual financial</p> <p>4 benefits to be 39.6 million. Is that also correct?</p> <p>5 A. [JOHNSTON] That is correct.</p> <p>6 Q. Please turn to Page 24.</p> <p>7 MS. PIEPER: At this point can I just</p> <p>8 point out: It is late in the day, and now it seems</p> <p>9 like we've been spending a lot of time going through</p> <p>10 and just asking him if his prefiled testimony that</p> <p>11 he's already attested to is correct. I don't want</p> <p>12 to spend a lot of time doing that. I just want to</p> <p>13 make sure there's a question here, that it's not</p> <p>14 just making sure that his testimony, that he's</p> <p>15 attested to, is correct. This would be the type of</p> <p>16 testimony that we would consider to be unduly</p> <p>17 repetitious and cumulative, and we would not allow</p> <p>18 it under 220 CMR 1.10(1).</p> <p>19 MR. REPPUCCI: Let me see if we can do</p> <p>20 something about that. If we could just have a</p> <p>21 moment.</p> <p>22 MS. PIEPER: Let's go off the record</p> <p>23 while they confer.</p> <p>24 (Discussion off the record.)</p>	609	<p>1 MR. REPPUCCI: Are you suggesting that</p> <p>2 he doesn't know how much is being asked for recovery</p> <p>3 in each year?</p> <p>4 MS. KIMBALL: No. I'm not speaking for</p> <p>5 him. But you're referring to a cost-of-service</p> <p>6 schedule which he does not have.</p> <p>7 MR. REPPUCCI: We'll just ask the</p> <p>8 totals, just to make sure we have the right current</p> <p>9 number. Does that work?</p> <p>10 MS. KIMBALL: Sure. I I'm just saying</p> <p>11 it's not his calculation. So we'll see how far you</p> <p>12 can go.</p> <p>13 Q. I just want to clarify that as of the</p> <p>14 revised annual charge to Colonial Gas that was</p> <p>15 submitted on April 20th that the company is</p> <p>16 proposing an annual charge of \$2,633,434 in an</p> <p>17 annual charge to Colonial; is that correct?</p> <p>18 A. [JOHNSTON] I don't know. So in our</p> <p>19 original testimony it was 2.7 million was the annual</p> <p>20 charge. If it's changed, I haven't got the updated</p> <p>21 number.</p> <p>22 Q. So you don't know why it's been changed?</p> <p>23 A. [JOHNSTON] No.</p> <p>24 Q. Thank you. I do have a quick question --</p>
608	<p>1 MS. PIEPER: Let's go back on the</p> <p>2 record. You may proceed.</p> <p>3 Q. I just want to ask one quick foundational</p> <p>4 question about what's being asked in terms of an</p> <p>5 annual charge for the GBE program to both companies,</p> <p>6 because I know that that's changed since the initial</p> <p>7 filing.</p> <p>8 If you would please turn to</p> <p>9 NG-DSD-2-COL, Revision 1.</p> <p>10 A. [JOHNSTON] Is that a revenue requirements?</p> <p>11 MS. KIMBALL: That's not his testimony</p> <p>12 or his calculation. That would be Mr. Dane.</p> <p>13 MR. REPPUCCI: It is incorporated into</p> <p>14 their direct testimony, so that's why we were going</p> <p>15 to ask for a quick clarification about just the</p> <p>16 number. And also I believe there might be a typo on</p> <p>17 Page 2 of Schedule 33 for that.</p> <p>18 MS. KIMBALL: Schedule 33 of Dan Dane's</p> <p>19 exhibit?</p> <p>20 MR. REPPUCCI: Yes.</p> <p>21 MS. KIMBALL: He's not going to be able</p> <p>22 to respond to that. He's probably not even ever</p> <p>23 seen it. Is there a way to ask a question and see</p> <p>24 if he knows the answer?</p>	610	<p>1 we'll ask the same question about Boston Gas. Right</p> <p>2 now it appears from Exhibit NG-DSD-2-BOS, Revision</p> <p>3 1, Schedule 33, that the company is proposing an</p> <p>4 annual charge of \$9,108,712 to Boston Gas. Are you</p> <p>5 aware that that number had been revised since the</p> <p>6 initial filing?</p> <p>7 A. [JOHNSTON] I am now aware. So I'm not a</p> <p>8 revenue requirements expert. What I do know is how</p> <p>9 we build up the cost of the program, and then the</p> <p>10 approach overall the team have taken to looking at</p> <p>11 the size and the scale of the overall investment and</p> <p>12 the time frame of the program. They looked at the</p> <p>13 overall revenue requirement and effectively</p> <p>14 allocated that over a ten-year period, looking for a</p> <p>15 flat fee over that period of time, which would</p> <p>16 effectively mean that if we were out for this case</p> <p>17 around for five years through the rate-case period,</p> <p>18 we would recover less than half of the total costs.</p> <p>19 And as we sit here today, National Grid's invested</p> <p>20 on the GBE program on behalf of Massachusetts</p> <p>21 customers close to \$25 million already.</p> <p>22 Q. But you don't know why that number would</p> <p>23 have changed since the initial filing for the annual</p> <p>24 charge to Boston Gas; right?</p>

611	<p>1 A. [JOHNSTON] He would need to speak to the 2 revenue requirements. 3 Q. Thank you. 4 MR. REPPUCCI: I apologize. One moment. 5 We're cutting down our questions. 6 Q. I would like you to turn quickly to Exhibit 7 AG-21-14. 8 A. [JOHNSTON] Yes. 9 Q. And this is a response that you gave 10 regarding a joint proposal for a settlement in the 11 Niagara Mohawk Power Corporation proceeding at the 12 New York Public Service Commission. Correct? 13 A. [JOHNSTON] I'm looking at the wrong thing. 14 21? 15 Q. Dash-14. 16 A. [JOHNSTON] Yes. 17 Q. How familiar are you with the settlement as 18 it pertains to the GBE program? 19 A. [JOHNSTON] I'm very familiar. 20 Q. Very familiar. So are you aware that the 21 settlement allowed -- do you know whether the 22 settlement allows for the recovery of costs beyond 23 the \$458.1 million total program costs? 24 A. [JOHNSTON] Only to the extent that</p>	613	<p>1 spend, whereas that's very different in Niagara 2 Mohawk, where the costs -- and we get the real-time 3 opex based on our full costs. So it's different, 4 but I think there's good customer protections in 5 terms of the opportunity to true up the real costs 6 versus actuals in what we've proposed. 7 Q. I think we have one more thing we'd like to 8 clarify: If you could turn back to the Accenture 9 business case, Attachment AG-21-15-1? 10 A. [JOHNSTON] Yes. 11 Q. I believe we are looking at Page 36. If 12 you could turn there. I just wanted to clarify the 13 number that says enhanced capabilities, 185 million. 14 A. [JOHNSTON] Correct. 15 Q. That enhanced-capabilities number is 16 included in the 458 million; correct? 17 A. [JOHNSTON] That is correct. 18 MS. PIEPER: Maybe we should take a 19 break now. We'll go off the record. 20 (Recess taken.) 21 MS. PIEPER: Let's go back on the 22 record. I remind the witnesses you remain sworn. 23 You may proceed. 24 A. [JOHNSTON] I do have an answer to the</p>
612	<p>1 National Grid's able to demonstrate incremental 2 benefits. 3 Q. So there is some requirement that they 4 demonstrate incremental benefits? 5 A. [JOHNSTON] Correct. 6 Q. Are there any other cost containment 7 safeguards in the settlement? 8 A. [JOHNSTON] There are a number of customer 9 protections in the settlement, the key one really 10 being the focus on the 458 cap subject to additional 11 benefits. They are keen for us to demonstrate the 12 benefits from the business case, and to the extent 13 we're unable to demonstrate those, they would be 14 looking to claw back a portion of the total costs. 15 They're the main two customer protections. 16 Q. In the company's cost recovery proposal for 17 the GBE program in this case, have any other -- have 18 any similar safeguards been proposed by the company? 19 A. [JOHNSTON] Not at this point in the 20 proposal, no. I think the key point in the way that 21 we've proposed here, which I guess is very different 22 to Niagara Mohawk, is the -- by breaking the costs 23 down over ten years, there is an opportunity to make 24 sure that costs are trueed up subject to actual</p>	614	<p>1 previous question, around the changing in the 2 revenue requirement for us, if that's helpful -- the 3 costs in the case. 4 It was in our Exhibit 5 NG-RRP-Supplemental-1, on Page 7, between Lines 6 6 and 9. But in short, it was really driven just by 7 the tax act, because the tax was tied into the cost 8 of capital. 9 Q. So just to summarize, for simplicity: 10 Those were changes driven by the tax act; correct? 11 A. [JOHNSTON] That's correct. 12 Q. Two more questions. You've mentioned using 13 fixed-price contracts with vendors in the GBE 14 program; correct? 15 A. [JOHNSTON] That's correct. 16 Q. Are there any penalties in those contracts 17 if people don't provide their deliverables on time? 18 A. [JOHNSTON] Yes, there are. So the 19 contracts are set up with a number of penalties tied 20 into them, I guess. So they're milestone-based, and 21 so if milestones are delivered, then payments are 22 made. If the solution goes in and it doesn't work, 23 there's technical hold-backs that are held back 24 until it does work and the solution is fixed. And</p>

615	<p>1 then there's proportionate fees tied to not just the 2 solution working but actually us starting to see the 3 benefits that we've put in the case being delivered. 4 Q. Thank you. 5 MR. REPPUCCI: That's all our questions. 6 MS. PIEPER: Thank you. 7 BENCH EXAMINATION 8 BY MS. LUKSHA: 9 Q. Hello. I have a followup from some of the 10 Attorney General's questions. When you spoke that 11 labor costs would be charged to the GBE program for 12 integrating existing systems, is that charged as 13 labor O&M or as a cost through service-company rent? 14 A. [JOHNSTON] It will be charged 15 ultimately -- all the GBE costs will be charged as 16 service-company rent. 17 Q. So it's a capital cost and not an O&M labor 18 costs? 19 A. [JOHNSTON] If we're building interfaces, 20 it will be a capital cost. 21 Q. Thank you. Could you please refer to 22 DPU-NG-12-2-1. 23 A. [JOHNSTON] Okay. 24 Q. Could you turn to the attachment.</p>	617	<p>1 A. [JOHNSTON] It says Boston Colonial, so I'm 2 assuming, but we'd probably need to go back to our 3 finance team and check, I think. We'll see if we 4 can find an answer and get back. 5 Q. My next question is a record request, and I 6 think maybe the answer to this would be incorporated 7 into that. So my next question is related to the 8 response to Information Request DPU-NG-12-1. 9 A. [JOHNSTON] Yes. 10 Q. So in your response it says that fiscal 11 year 2018 O&M reflects actuals through February 12 2018, and I was wondering if you know total fiscal 13 year '18 costs yet. 14 A. [JOHNSTON] I do. I'm testing my -- 15 Give or take on a total basis for the 16 enterprise, we spent \$80.5 million, which is a 17 combination of capex and opex. The opex element of 18 that I would just need to check, but the total cost 19 of capital and opex on an enterprisewide basis was 20 \$80.5 million. 21 Q. I think the table is just specific to 22 Massachusetts? 23 A. [JOHNSTON] It's just specific to 24 Massachusetts and capex. I would need to follow up</p>
616	<p>1 A. [JOHNSTON] Yes. 2 Q. Is this an example of one of those costs to 3 integrate an existing system? 4 A. [JOHNSTON] Yes, that's exactly correct. 5 Q. And so staying on this response: Is the 6 total investment GBE-program-wide, so it's not the 7 total investment charged to Boston Gas or Colonial 8 Gas, it's total for all of the gas distribution 9 companies? 10 A. [JOHNSTON] The GBE program is being done 11 as an enterprisewide solution, and then the costs 12 are being allocated out. 13 Q. Is this the total cost or is this the 14 allocated cost for the total investment? 15 A. [JOHNSTON] In particular in relation to 16 this particular exhibit? 17 Q. Yes, the number, the 1.4 million. 18 A. [JOHNSTON] I would need to double-check. 19 I'm not 100 percent sure whether total investment 20 here is the National Grid total cost or whether it's 21 the allocated cost to Massachusetts. We'd need to 22 probably take it away and respond back. 23 MS. KIMBALL: Is there really nobody 24 here that can answer that?</p>	618	<p>1 on what the Massachusetts-only component of the opex 2 is. 3 Q. Just to confirm, the revenue requirements 4 for capital costs in fiscal year '18, 11,722 on 5 DPU-NG-12-1, is the same number in DPU-NG-12-2, 6 Attachment 1, that we were just looking at, and then 7 total rent charged to company? 8 A. [JOHNSTON] I don't know if I understand 9 your question. Can you say it again? 10 Q. Keep the response to NG-12-1 out and look 11 in the table for revenue requirements for capital 12 costs, the number, 11,722. 13 A. [JOHNSTON] Yes, sorry. 14 Q. And that's the same in the next response, 15 DPU-NG-12-2, Attachment 1? That's how you arrived 16 at the number in the table? 17 A. [JOHNSTON] You've got it. So therefore 18 you are confirming my previous question, I guess -- 19 that the 11,722 is just the Boston component. 20 Q. But the total investment number, you're not 21 sure if that's the Boston and Colonial that would 22 be -- 23 A. [JOHNSTON] I am not. 24 Q. My record request is, in the table that's</p>

619	<p>1 in DPU-NG-12-1 can you please update for the fiscal 2 year '18 O&M actuals, but also, as part of this 3 record request, I'd like a few additional pieces of 4 information. So could you please also include a 5 line item for the calendar year 2017 numbers for the 6 revenue requirements for capital costs, O&M, and 7 total -- and also, because I'm not 100 percent sure 8 if this question you can answer or if it's for the 9 revenue requirements witness, but I'll state it and 10 you can let me know. Can you provide a rate-year 11 rent expense calculation for the capital costs, so 12 for the costs that would be in the revenue 13 requirements for capital costs column. 14 A. [JOHNSTON] For which year? 15 Q. So it would be for any investments that 16 would be in service as of May 1st, 2018. 17 A. [JOHNSTON] There's going to be no change. 18 Q. Would you be able to indicate that in the 19 response, record request response. 20 And then the final piece: If you could 21 also just separate the total numbers between Boston 22 Gas and Colonial Gas, and please provide this in 23 Microsoft Excel. 24 A. [JOHNSTON] I'll play back what I think</p>	621	<p>1 testimony. 2 A. [JOHNSTON] Yes. 3 Q. Do you see the list, 1 through 7? 4 A. [JOHNSTON] I do. 5 Q. Is it possible to categorize these into the 6 three core improvement areas for work management, 7 asset management, and customer enablement, if 8 they're not already indicating those? 9 A. [JOHNSTON] So maybe I'll just sort of walk 10 through them one by one. So the first one, the 11 enterprise work and asset management solution for 12 the U.S. is kind of the two, work management and 13 asset management. 14 The second piece is really the work 15 management side, so scheduling and dispatch of work. 16 The third piece, the GIS, is really tied 17 back to the asset management, so it's the maps of 18 our assets and how we manage those. 19 No. 4, the implementation of the field 20 mobility solution, really is again about supporting 21 work management and delivery of work in the field. 22 Five, the customer, the experience 23 solution tied to the call center, is really our 24 customer enablement piece. It's the third main area</p>
620	<p>1 you've asked, just to check: I think you're looking 2 for the table in DPU-NG-12.1 to include calendar 3 year 2017. 4 Q. Yes. 5 A. [JOHNSTON] And all of the data for each of 6 the columns, you would like the data for the whole 7 table to be broken out by Boston and Colonial, and 8 you'd like us to confirm that there has been no 9 further revenue requirement for capital costs beyond 10 what's in the table already. 11 Q. If a calculation for a rate year revenue 12 requirement would be different than the revenue 13 requirement in the fiscal year '18. 14 And if I could also add: If you have 15 supporting calculations or any documents that 16 support the calculations, please also include that 17 in the response. 18 I just want to confirm that that also 19 includes updating fiscal year '18. 20 A. [JOHNSTON] Correct. 21 MS. PIEPER: That's going to be Record 22 Request DPU-11. 23 (Record Request DPU-11.) 24 Q. Could you please turn to Page 22 of your</p>	622	<p>1 of improvement. 2 The enterprise program portfolio 3 management program is really about managing our 4 investments in our assets, so it's really an asset 5 management piece, as is the asset investment 6 planning and management tool, which is No. 7. 7 Q. Thank you. I have a similar question for 8 the work streams which are listed on Exhibit 9 NG-GBE-3. 10 A. [JOHNSTON] So probably as we go through 11 I'm going to say some of these are almost enabling 12 work streams to support the three, if that works. 13 At the top, where we start with the 14 portfolio office, that's really the team to manage 15 keeping everything on track and it's joined up when 16 we manage the dependencies. So that's supporting 17 the whole program. 18 The same is true for the next two, 19 change management, change leadership, operating 20 model. That's supporting the overall program. 21 Asset management is clearly very much 22 asset management. 23 Customer engagement is very much 24 customer engagement.</p>

623	<p>1 GIS is asset management. 2 Work management field enablement is work 3 management. 4 Supply chain really is supporting work 5 management. 6 Field technical training is really an 7 enabler. We heard again that being talked about 8 this morning. 9 The same with data management and with 10 ISE, which stands for IS enabling, so that's some of 11 the enabling architecture that the platforms stand 12 on to enable us to deliver the program. 13 And then the final piece, value 14 assurance, is a really important part of our 15 program, where we have an independent third party 16 doing regular reviews of how the program's running, 17 to make sure that we're doing all the right things 18 to keep the program on track -- again, enabling, 19 covering all the elements. 20 Q. I might not have heard it and I don't see 21 it in the transcript, but for the operating model -- 22 A. [JOHNSTON] That would be another enabling 23 one across all three. 24 Q. Could I refer you -- and I'm not sure</p>	625	<p>1 CROSS-EXAMINATION 2 BY MR. MERRITT: 3 Q. Good afternoon, Mr. Johnston, 4 Ms. Irani-Famili. I realize it's late in the day, 5 so I'm going to try to keep this short. 6 My name is Kevin Merritt. I represent 7 the Steelworkers Local 12003. 8 MS. KIMBALL: Is it possible to speak up 9 a little bit? 10 MR. MERRITT: I sure can. 11 MS. KIMBALL: When you talk down it's 12 hard to hear you. 13 MR. MERRITT: Understood. Usually 14 people complain that I'm too loud. 15 Q. I would like to start by turning to your 16 testimony, and in particular, Page 32 of your 17 testimony at the very top, Line 1. You say there it 18 says as part of the change management process, 19 comprehensive training will be provided to all users 20 of the systems, the GBE systems here? Do you see 21 that? 22 A. [JOHNSTON] Yes. 23 Q. Those words, "comprehensive training," can 24 you provide some detail about what that means?</p>
624	<p>1 you'll have this because I think it's sponsored by 2 the IS panel, but it's the response to Information 3 Request DPU-NG-26-11, the attachment. 4 A. [JOHNSTON] I won't have it, but I can see 5 people rushing to help me. 6 Q. Could you please turn to Page 3 of the 7 attachment, the first line for the ArcFM software 8 upgrade. Would this be another example of 9 integrating an existing system into the GBE program? 10 A. [JOHNSTON] Yes. So across National Grid's 11 U.S. footprint we have, I think, five different 12 versions of GIS or mapping. We had an ESRI solution 13 in Massachusetts already, but it was a very old and 14 outdated version. And so part of us -- we've 15 effectively, we're implementing a completely new 16 version of ESRI because there's no upgrade path from 17 the one that we have; it's too old. And so this 18 was, I think, an investment to support being able to 19 move the data across to enable us to do that. 20 Q. Thank you. 21 MS. LUKSHA: I have no further questions 22 at this time. 23 MS. PIEPER: Thank you. The union may 24 proceed.</p>	626	<p>1 A. [JOHNSTON] I will pass this one to 2 Reihaneh. She's in charge of it. 3 A. [IRANI-FAMILI] By "comprehensive 4 training," a lot of the systems, you could argue 5 that they have used -- for example, ESRI, it's a 6 mapping system that has been in place for quite a 7 while in Massachusetts. So in some other 8 organizations you might infer from that that because 9 this has been in process you might not need to do 10 the same level of training that you would otherwise 11 do. 12 What we have done, we have made sure, 13 and as a principle for our training have made sure, 14 that every time we have a release with the GBE 15 program that we train people, both what we would 16 like to call drip training, so starting early and 17 exposing them to the solution, do formal classroom 18 training that would follow up by kind of a test, an 19 assessment, at the end -- that we would make sure 20 that our people are ready to use the solution when 21 they go back. 22 We have done this in Rhode Island for 23 this last release. It has been very successful. We 24 had three or four individuals that didn't pass the</p>

627	<p>1 test on the first go, but then they were able to 2 complete it. And it has seen good success. 3 We intend to continue that and continue 4 improving that approach as we move to other 5 jurisdictions. 6 A. [JOHNSTON] I think I would just add to 7 Reihaneh's point of: We're doing training for this 8 implementation very differently than we've done in 9 the past. So we've been running road shows, where 10 our front line employees are being able to get to 11 see the solution long before it gets implemented. 12 We've got an app that every National Grid employee 13 can download on the smartphone, that already has 14 training terms on them so people can familiarize 15 themselves with the tools. 16 The tools themselves are a lot more 17 intuitive, with modern solutions, than maybe some of 18 the solutions in the past. And my evidence of that 19 is we've had lots of visitors to our program office 20 over in Waltham, including the chairman of National 21 Grid, who is not the most tech-savvy individual, 22 maybe, that has ever existed, and he was able to 23 process work orders on an iPad just with a couple of 24 minutes of conversation.</p>	629	<p>1 So what we have done with those folks is 2 that we have gone out prior to the solution being 3 completed, what Johnny referred to as road shows, we 4 have gone out and we have given them the devices 5 that they can touch and feel and give us a little 6 bit of feedback. We have continued that on as we 7 have made those improvements. We've brought some of 8 those people and some of people in other 9 jurisdictions -- Massachusetts, upstate New York, 10 and downstate New York -- as part of our testing. 11 And part of that is to get their feedback into the 12 testing, but part of that is in this continuation of 13 the learning, so they see how their work is going to 14 change and what that system looks like. 15 And then, prior to the go-live, we've 16 had classroom trainings where they have had to go to 17 class, use the system, log in, what we call 18 simulations, basically run through one of the 19 processes that they would actually do day one when 20 they get this device, practice through that, ask 21 their questions, and then go back to the field. 22 So we understand with each of the roles, 23 we do impact analysis, understanding what is 24 changing for that workforce, not just in the</p>
628	<p>1 And I think the evidence that we've seen 2 in our first Rhode Island go-live of our union 3 employees and supervisors really being able to pick 4 up the tools and use them really pretty effectively 5 in the first week has been pretty positive to see. 6 I can stand and vouch for the approach 7 that Reihaneh has put in with these multiple 8 implementation points, making sure that employees 9 are tested, that they know how to use the systems 10 before we go live, has worked very well. 11 Q. There was a lot in that answer. I'd like 12 to drill down a little bit on -- maybe get more 13 concrete. Let's imagine that I'm a markout person, 14 a locator, and I am -- how is my job going to 15 change? What sort of training am I going to get on 16 the tools that are being rolled out through GBE? 17 A. [IRANI-FAMILI] I can't talk about the 18 markout person right now. But I can give you an 19 example -- for example, of a collections tech or an 20 I&R tech, something that we have done. 21 I&R, for example, in Rhode Island, they 22 used to use paper, and now they would have a 23 system -- instrumentation and regulation. So 24 those -- that work is now done on a computer system.</p>	630	<p>1 technology and the touch and feel, but in the 2 process that they would be following, and then we 3 have and will be developing training to address 4 those. 5 Q. Okay. So if I heard your answer correctly, 6 it was speaking to somebody in I&R, not somebody who 7 would be, for example, out in the field in a truck, 8 logging in on a laptop to get work that way. 9 A. [IRANI-FAMILI] The I&R tech is someone out 10 in the field, in the truck. 11 Q. My mistake. I think you used the term 12 "impact analysis," that's been done for all of the 13 roles? 14 A. [IRANI-FAMILI] So for every role -- 15 earlier on we talked about us releasing capabilities 16 of these solutions. So for all of those 17 capabilities -- so collections being one, CMS, the 18 short cycle of work that's going to come up -- for 19 all of those, as we get towards development of that, 20 we do that impact analysis -- so organizational 21 impact, process impact, technology impact. 22 And then, through that impact analysis, 23 that gives us an input to be able to analyze what 24 this workforce needs to become effective in the new</p>

631	<p>1 system.</p> <p>2 Q. So has an impact analysis been done already</p> <p>3 for the damage prevention department?</p> <p>4 A. [IRANI-FAMILI] I do not believe so. That</p> <p>5 capability as it's referenced in Exhibit NG-GBE-6 is</p> <p>6 coming on later. So we would be doing that once we</p> <p>7 get to that.</p> <p>8 Q. But as a sort of a bottom line, you've got</p> <p>9 commitments to provide comprehensive training to</p> <p>10 everybody in every role sort of in every department;</p> <p>11 correct?</p> <p>12 A. [IRANI-FAMILI] That is my job, and I would</p> <p>13 lose it if I don't.</p> <p>14 Q. I'd like to turn your attention to the</p> <p>15 response to Information Request AG-19-8, please.</p> <p>16 Let me know when you're ready.</p> <p>17 A. [JOHNSTON] Yes.</p> <p>18 Q. The second paragraph of the response here,</p> <p>19 there's a sentence that starts about three lines</p> <p>20 down in the paragraph, at the very right, "The new</p> <p>21 systems." Do you see that? "The new systems</p> <p>22 encompassing GBE represent a very significant step</p> <p>23 change in the day-to-day business processes</p> <p>24 performed by employees, and optimal utilization will</p>	633	<p>1 able to shorten that, so come back to the level that</p> <p>2 we worked prior to the release relatively quickly.</p> <p>3 That several years is not about coming</p> <p>4 back to the level of performance that we are at</p> <p>5 today. It talks about getting better, creating that</p> <p>6 step change. So now I can do what I used to do</p> <p>7 before in the same amount of time, but it takes time</p> <p>8 to be able to do it much better and much faster,</p> <p>9 much quicker. And that comes with practice. Not a</p> <p>10 lot of that is training. The training, what it does</p> <p>11 is, it reduces that dip in productivity. It's the</p> <p>12 on-the-job training, seeing the different issues</p> <p>13 that come up and working through those that would</p> <p>14 actually enable that increase in productivity and</p> <p>15 performance.</p> <p>16 I would add to that: In what we have</p> <p>17 been doing and are doing, and Johnny mentioned this,</p> <p>18 we are making training material available, so it</p> <p>19 helps people in that journey past getting back to</p> <p>20 the normal day-to-day, because we believe that as we</p> <p>21 take away the issues of these laptops, that the</p> <p>22 battery dies on them, and provide people with the</p> <p>23 updated technology and systems, we have an</p> <p>24 opportunity to go much beyond the level of</p>
632	<p>1 not occur immediately on the in-service date." Do</p> <p>2 you see that?</p> <p>3 A. [IRANI-FAMILI] Yes.</p> <p>4 Q. And then just a little bit further ahead it</p> <p>5 says, "It will take several years for employees to</p> <p>6 learn to work with the new system to be in a</p> <p>7 position to utilize the functionality to its optimum</p> <p>8 capabilities." Does that mean that the company is</p> <p>9 committed to provide that comprehensive training you</p> <p>10 talked about over, quote, "several years"?</p> <p>11 A. [IRANI-FAMILI] There are a couple of</p> <p>12 things in this response that you have mentioned.</p> <p>13 One is that it is not going to be immediate, that</p> <p>14 they would get that step change in the business</p> <p>15 performance. I just want to address that.</p> <p>16 With every change, whether it's process</p> <p>17 change, you would argue management change, or</p> <p>18 technology change, you would have a duration of a</p> <p>19 dip in productivity. And what we are doing, in</p> <p>20 everything that we have done, we try to minimize</p> <p>21 that duration, so you come back out of that dip to</p> <p>22 get back to your normal levels of operation.</p> <p>23 And I think in the work that we have</p> <p>24 done in Rhode Island, we have shown that we were</p>	634	<p>1 performance that we have today and serve customers</p> <p>2 in a completely new way.</p> <p>3 So that journey is going to take some</p> <p>4 time.</p> <p>5 Q. So if I'm hearing you right, you're making</p> <p>6 a distinction between the period of time over which</p> <p>7 training is to be provided and the period of time</p> <p>8 over which improvements will be seen through</p> <p>9 practice, primarily, and not training.</p> <p>10 A. [IRANI-FAMILI] Yes. So training allows</p> <p>11 people to use the tools, and practice helps them</p> <p>12 make perfect. It's like playing piano; right? So</p> <p>13 it's like you know the notes, you know how to play,</p> <p>14 but for you to become that performer to the next</p> <p>15 level, it just takes the months and years of</p> <p>16 practicing those notes over and over.</p> <p>17 Q. So is there -- does the company have a</p> <p>18 sense today of what the period of time is over which</p> <p>19 training will be provided as part of the GBE?</p> <p>20 A. [IRANI-FAMILI] Yes.</p> <p>21 Q. Can you provide some detail on that?</p> <p>22 A. [IRANI-FAMILI] So our training is up to</p> <p>23 the point of the release, and then we have what we</p> <p>24 call makeup training that's available post that, and</p>

635	<p>1 we have training material available on our systems 2 for access by those employees post that. 3 A. [JOHNSTON] Very simply, the training is 4 planned to be done prior to go-live so that people 5 know how to use the systems. 6 Q. Ms. Irani-Famili, you used the term "makeup 7 training" just now. Is that intended to be a kind 8 of a refresher training? 9 A. [IRANI-FAMILI] So how we've used that in 10 Rhode Island is, we've made that available for 11 people that are either new to the job, have come on 12 after the go-live, or if someone says, "I'm still 13 uncomfortable with the solution; I would like to go 14 through the training again," we've made that 15 available to them as well. We hope that we do not 16 need to do that, but that's one of the ways of us 17 supporting. 18 Q. Now I'm going to direct your attention to 19 testimony that, as I think Mr. Johnston mentioned, 20 you were here for this morning, the testimony of Amy 21 Smith and Dan McNamara, who mentioned some things in 22 their direct about the GBE program. I'd like to 23 just ask a few followup questions of you on that. 24 On Page 6 of their direct testimony --</p>	637	<p>1 an issue with some of these new systems that are 2 being rolled out as part of GBE, that they, 3 particularly field employees, are going to be 4 expected to contact their supervisors for help if 5 they, for example, can't use the tool to locate a 6 pipe? 7 A. [JOHNSTON] I think I would say a couple of 8 things to that. So to the extent that computer 9 systems don't work, the first point of contact for 10 our employees should be our IT help desk, to log a 11 concern for getting that resolved. 12 In terms of when we first go live with 13 our gas business enablement solution: We've been 14 putting gas business enablement employees into the 15 local yards, so that there's someone local from our 16 program that can help employees that have got 17 particular concerns with how to use the solution in 18 those sort of first couple of weeks of teething 19 issues, as people go from the theory of training to 20 the reality of doing the job. So there will be 21 support there. 22 Clearly, for every field employee, they 23 should never feel they're alone out there, and the 24 supervisor's always there to support.</p>
636	<p>1 so Page 6, starting on Line 18, down at the bottom: 2 This is a question and a response, broadly speaking, 3 about paper and electronic records that are used for 4 locating mains and services. Do you see that? 5 A. [JOHNSTON] Yes. 6 MS. PIEPER: Just to make sure we're all 7 on the same page, I think you're talking about 8 Exhibit NG-AS/DM-Rebuttal? 9 MR. MERRITT: That is it. Apologies. 10 MS. PIEPER: Thank you. 11 Q. So the response follows onto Page 7. And 12 in particular, starting on Line 6 of Page 7, there's 13 the sentence, "If unable to locate a facility 14 through these methods," referring to the paper and 15 electronic records, "employees can contact a 16 supervisor, who can help them identify other 17 methods." First of all, do you agree with that 18 statement? 19 A. [JOHNSTON] I think we're here for gas 20 business enablement, not the operations of the 21 business. So I wouldn't want to speak on behalf of 22 operational leaders. 23 Q. Let me ask the question a different way: 24 Is it your understanding that when an employee has</p>	638	<p>1 Q. You mentioned just now GBE employees. Can 2 you be more specific what kinds of employees they 3 are? 4 A. [IRANI-FAMILI] So a couple of things. 5 One, you have mentioned this line item in the 6 NG-SA/DM-Rebuttal-1 testimony. That line does not 7 refer to gas business enablement. It says, "If 8 unable to locate a facility through these methods, 9 an employee" -- that is something that we can't talk 10 to. That's about the operation of today. 11 So that aside, now I want to answer your 12 question about the post-go-live support. So for the 13 post-go-live support, which is the days, the two 14 weeks after the go-live, what we have done, we have 15 people from the program that have been involved in 16 the development of the program, of the solution, to 17 go out and be available in the field to answer 18 questions. We intend to continue to do that, to 19 hand-hold the employees in those first few days as 20 they go into real live. We have found it to be very 21 effective, and I think that is going to address that 22 concern. 23 We also have, as Johnny said, a help 24 desk that people can contact and get their issues</p>

639	<p>1 resolved, and that has been very successful as well. 2 Q. Okay. Just to go back to the question as I 3 had asked it: The GBE employees that you're talking 4 about, I had asked what kinds of employees they are, 5 what their roles are. That was what I was intending 6 to ask, anyway. So, for example, what you've just 7 described, you've got someone involved with the 8 program being made available to employees in the 9 field or in the yard. Is that person who's been 10 involved in the program, is that a programmer, is 11 that person a technical person? What's their role? 12 A. [IRANI-FAMILI] Some of those people are 13 people on my team that have been involved in 14 developing and delivering the training and 15 developing change impact assessments that we talked 16 about. Some of those people have been on my 17 colleague's team, who are involved in the business 18 process and developing the solution. And we have 19 had a couple of people from our IS also available. 20 So we select -- we select a cross- 21 section that we think will best fit the support. 22 Q. You've talked about the phased rollout of 23 the program. Is there a plan to increase the number 24 of GBE employees that are made available for</p>	641	<p>1 Q. So Request Part C is asking whether the GBE 2 program's information systems will be outdated by 3 the time -- essentially by the time they're rolled 4 out. Is that a fair characterization? 5 A. [JOHNSTON] Of the question? 6 Q. Yeah. 7 A. [JOHNSTON] That's it. 8 Q. And the answer is no. This is on Page 2. 9 And I'm going to summarize that answer by saying 10 that the GBE program is using software as a service, 11 SAAS, S-A-A-S, and that the SAAS model means that 12 updates to SAAS software are mandatory. That's 13 essentially what this answer is saying; is that 14 fair? 15 A. [JOHNSTON] Yes. 16 Q. You've talked about the complexity of the 17 GBE program, and in particular, Mr. Johnston, you 18 talked about how all of the parts, literally all of 19 them, are going to have integrations. 20 A. [JOHNSTON] Uh-huh. 21 Q. Can you explain, describe, what an 22 integration is? 23 A. [JOHNSTON] Integration is when you get one 24 computer system connected to or talking to another</p>
640	<p>1 training and assistance purposes like this to other 2 employees as the program rolls out? 3 A. [IRANI-FAMILI] It would depend on how many 4 people we are impacting. So if we have a release 5 that impacts 100 people, you don't need seven. But 6 if we have a release that impacts eight or nine 7 hundred people, then we need a bigger team. So it 8 would really depend the complexity of the system we 9 are rolling out, the newness of it to those users, 10 the number of users that are out there. And then we 11 would see what kind of a team we need on the ground 12 for support. 13 It is a balance, because it's a cost to 14 our customers. So you need to balance that cost to 15 the ability to effectively support the employee. 16 Q. If I could turn your attention to the 17 response to Request DPU-NG-22-5. 18 A. [JOHNSTON] Yes. 19 Q. This request is in multiple parts. It 20 appears to my eyes the parts are A, B, and C. The 21 responses are A and B, and then on the second page I 22 think that is supposed to be C, but it doesn't say 23 so. 24 A. [JOHNSTON] Yep.</p>	642	<p>1 computer system. And I think as one of the exciting 2 things -- architecturally, we'll get a little bit 3 geeky into IS talk. But the architecture that our 4 team is using for the integrations is using a thing 5 called microservices. Historically, when we've 6 connected some of our legacy systems together, 7 they've been very much hard-wired together with an 8 interface that goes from one system to another, and 9 if anything changes in one system, you then -- 10 there's a concern that the interface may no longer 11 work, and this may be the direction that you're 12 heading down. 13 In the world of microservices, actually 14 the integration is far looser, and the way that the 15 systems talk to each other, they make sort of 16 general requests across an integration layer. That 17 means that the integration layer is protecting the 18 two systems, they're not hard-wired together. 19 So that's when we mean when we talk 20 about integration. It's about how do we move data 21 from one system to another. And really, we've got 22 some pretty smart ways of doing that through GBE. 23 Q. If you'll allow me to break that down for 24 lay, non-IS folk. An integration is fundamentally a</p>

<p style="text-align: right;">643</p> <p>1 program; is that right? A piece of software that 2 helps one piece of software talk to another piece of 3 software? 4 A. [JOHNSTON] It's the path for moving data 5 between one piece of software and another. 6 Q. Made out of code? 7 A. [JOHNSTON] With code, correct. 8 Q. You've mentioned just now that integrations 9 go between -- they're a layer between two different 10 technologies, and sometimes those technologies 11 change. Correct? 12 A. [JOHNSTON] Yes. 13 Q. Now, the SAAS model is essentially a 14 subscription model; correct? 15 A. [JOHNSTON] Yes. 16 Q. You're subscribing to someone else's 17 software. 18 A. [JOHNSTON] Yes. 19 Q. The entities that own the software to which 20 you are subscribing, they control the software; 21 right? 22 A. [JOHNSTON] Yes. 23 Q. So they control the update process for the 24 software.</p>	<p style="text-align: right;">645</p> <p>1 there is visibility into what's changing. 2 A. [JOHNSTON] And I guess without overdoing 3 the answer: The Salesforce platform, as long as 4 you're customizing within the platform, guarantees 5 that that functionality will continue to work in 6 future -- in future upgrades. As long as you're 7 configuring the platform within its boundaries, it 8 will continue to work. If you go down the route of 9 starting putting customizations in, then we'll be at 10 risk of having to manage those. So clearly we're 11 looking to not have customization as part of the 12 platform. 13 Q. Let me see if I understand. Are you saying 14 that National Grid should be able to look out a 15 period of years for each of the SAAS solutions that 16 it has and know exactly what changes are coming and 17 when for every update cycle? 18 A. [JOHNSTON] Yes, I am saying we'll have 19 visibility of future updates. I'll say that what 20 we've put in today will continue to work, and then 21 there will be a decision point for us as a business, 22 as new features and functionalities are added to the 23 solutions, are they valuable to our customers and do 24 we want to implement them or actually are they</p>
<p style="text-align: right;">644</p> <p>1 A. [JOHNSTON] That is correct. 2 Q. Does National Grid have any input into the 3 update process when one of these providers of a SAAS 4 platform decides to update its software? 5 A. [JOHNSTON] So, yes, in terms of what the 6 content of those upgrades are. So Salesforce, for 7 example, provides three updates a year, and as part 8 of their future road map for the solutions, they've 9 been working very closely with National Grid around 10 what are the capabilities that are really going to 11 help us deliver for our customers. And so they're 12 enhancing and changing their road map, enhancing 13 their solution to help meet what we would like to do 14 for our customers. 15 So I think we have a degree of 16 influence. But to your point, do the updates come 17 on a regular drumbeat, then, yeah, absolutely they 18 do. 19 A. [IRANI-FAMILI] And their customers of 20 those solutions are aware of what -- it's not one 21 morning you'll wake up and there's a release. They 22 have three releases in a year, and those are 23 planned, and there's a road map a few years ahead 24 that they actually share with their customers. So</p>	<p style="text-align: right;">646</p> <p>1 unnecessary and we'll just continue operating the 2 way we always have been? 3 Q. Is there any accommodation for or 4 accounting for expected updates to these SAAS 5 software solutions in the GBE's costs and so on? 6 A. [JOHNSTON] So we have -- the costs that 7 are in the case today are all implementation costs. 8 As you would anticipate, once the systems are 9 implemented there will be ongoing costs for those 10 license fees and for support and for the teams to 11 manage that, known as RTB costs. In our 12 Massachusetts case it's a backward-looking case, and 13 so we've not put future costs in for that. But yes, 14 as part of our sanctioning of the program, those 15 costs are in there. They're as part of the 16 documents provided as part of our responses. 17 Q. So just to clarify: A little while ago, I 18 think maybe in response to a prior line of 19 questioning, you mentioned fixed-cost contracts. 20 A. [JOHNSTON] Correct. 21 Q. To clarify: The fixed costs for those 22 contracts, those are implementation-only? 23 A. [JOHNSTON] Correct. 24 Q. And not, for example, if a dramatic change</p>

647	<p>1 comes down the pike with one of these software -- 2 SAAS software solutions that requires you to make 3 changes to your systems? 4 A. [JOHNSTON] So absolutely the costs are 5 about implementation costs, not ongoing, running 6 costs. You're making it sound as if we're going to 7 suddenly get these crazy changes in functionality 8 that's not going to enable the business to run. 9 There's key capabilities with enhancements that will 10 come over time that we can choose to use those 11 enhancements or not. And we would be doing that, to 12 the extent there was business value and it was a 13 prudent thing to do to serve our customers. 14 So we believe that we absolutely, our 15 forecasting of our future costs and what it's going 16 to cost to run these, that we're in good shape in 17 terms of understanding those costs. 18 A. [IRANI-FAMILI] It actually is a benefit to 19 us as well, because our systems are not going to be 20 obsolete in a few years, as we make those decisions 21 and those updates as they come, so we would not be 22 in a position that we would have to reinstate a 23 solution just because it's obsolete and not 24 supported. It's actually a benefit, with limited</p>	649	<p>1 thinking about what that infrastructure is going to 2 look like, and we will ensure that post-GBE we have 3 that infrastructure in place, being able to assess 4 if there is a major shift and make the right 5 decisions on how to address that through either 6 training, communication, or other means. 7 Q. So the process you're talking about for 8 post-GBE impact analysis, even if it's not the 9 impact analysis you were talking about before, it's 10 a similar process? You're looking to the impact 11 that a change is going to make? 12 A. [IRANI-FAMILI] Of the solution. Because 13 we are talking about two different things. When I 14 look at GBE -- right now, when I look at an impact 15 to a role, it's much broader than, oh, Salesforce 16 front-page change. It's about the way that that 17 works, the expectations, the performance is 18 changing. 19 Later on that is going to be limited to 20 Salesforce Page 1 looks different. It's a very 21 different conversation. 22 Q. You'll have to pardon me. A number of my 23 questions have been asked throughout the day 24 already. Turning your attention to Attachment</p>
648	<p>1 risk. 2 Q. Will employees continue to receive training 3 as these solutions are updated and their features 4 and functions change? 5 A. [IRANI-FAMILI] That's something that we 6 have talked about a lot and thought about a lot. 7 How we are managing that in that to run the business 8 is ensuring that every time there's a release, 9 there's an assessment if that release is going to 10 impact the user or the user experience in a 11 significant way that would need additional training, 12 and if there is, it needs to be considered and a 13 training program needs to be developed. We call 14 that the sustainment post-GBE, and so that's one of 15 the considerations that we work through. 16 Q. Are you referring in your analysis just now 17 to that impact analysis that we talked about 18 earlier? 19 A. [IRANI-FAMILI] It is an impact analysis, 20 but you could apply that many different ways. This 21 is specifically about, post-GBE, if there is a 22 release that has an impact on the user, how we are 23 going to as a sustaining organization deal with 24 that. And what I'm clarifying is that we are</p>	650	<p>1 AG-27-20-17-1. Sir, just to orient us: This is a 2 table, or perhaps a pair of tables, of forecasted 3 benefits of the GBE implementation for Boston Gas on 4 the first page and Colonial Gas on the second page. 5 Am I right? 6 A. [JOHNSTON] That is correct. 7 Q. So the second column on this first page for 8 Boston Gas is headed Benefit Description. Then 9 about halfway down the column we see two entries for 10 damage prevention. Do you see those? 11 A. [JOHNSTON] Yes. 12 Q. One is reduced travel mileage, and the 13 other is reduced travel time. In the entry 14 immediately to the right of that, in the third 15 column, which is benefit calculation and baseline, 16 we see 2.5 percent reduction in travel distance and 17 2.5 percent reduction in travel time. Do you see 18 those? 19 A. [JOHNSTON] Uh-huh. 20 Q. Can you tell me, how did those 2.5 percent 21 figures get calculated? 22 A. [JOHNSTON] So we did a strategic 23 assessment, really trying to think through how do we 24 look at all these systems together with Accenture,</p>

<p style="text-align: right;">651</p> <p>1 and a lot of the conversation that we had with them 2 when we got to benefits was, well, actually a lot of 3 what we're doing is replacing old things with new 4 things, and often you don't see benefits with 5 assessment of replacement programs. But it's a 6 significant investment, and we were looking for 7 opportunities to improve how we operated our 8 business. 9 So the 2 1/2 percent here really was 10 Accenture's experience from doing these types of 11 projects in more utilities in the U.S. than anyone 12 else, around the sort of optimization improvements 13 that you can see when you put an autoscheduling 14 solution in that will take all the work orders and 15 use a computer algorithm to figure out what's the 16 best route and order to do those jobs, rather than 17 just giving an individual a bunch of jobs to choose 18 themselves. 19 Q. Just to clarify: The 2.5 percent figure is 20 something that Accenture came up with, not something 21 that the company came up with? 22 A. [JOHNSTON] Correct -- Accenture working 23 with us. 24 A. [IRANI-FAMILI] But it has their experience</p>	<p style="text-align: right;">653</p> <p>1 it's not doing the job any quicker, it's literally 2 spending less miles in the car. 3 A. [IRANI-FAMILI] And I will give you an 4 example. With a leak survey I was doing a 5 ride-along, and we went to a leak survey, and right 6 now they don't have that information on the GPS, so 7 when they get that, they need to put it into the 8 GPS, depending on the GPS system that they have. 9 And the lack of that accuracy and the accuracy of 10 the map and the system they had, we had to like 11 drive around to find the address. 12 So what this does right now, if you 13 trust the Google Maps and the Waze that you use on 14 your phone, that's now the ability that this is 15 going to give our workers. And in that simple 16 example, we ended up me pulling my phone up and 17 using Google Maps to find the address. 18 So that 2.5 percent reduction is not 19 only a reduction of travel time, looking for those 20 addresses, but frustration of that employee, that 21 when they come to work they can't even find the 22 customer's house to go and respond to them. 23 Q. On the subject of the accuracy of maps, I'd 24 like to turn you back to the testimony of Ms. Smith</p>
<p style="text-align: right;">652</p> <p>1 with other implementations. We don't have that 2 similar experience. 3 Q. So apart from Accenture's experience, you 4 don't know how they came up with this very specific 5 2.5 percent number. 6 A. [JOHNSTON] It's from our experience. 7 A. [IRANI-FAMILI] From their experience. 8 Q. So do you have a sense, from the concrete 9 perspective of the day-to-day work of a damage 10 prevention employee, how that 2.5 percent reduction 11 in travel distance and travel time is going to be 12 experienced by the employee? What does that look 13 like? 14 A. [JOHNSTON] We're getting really into the 15 detail of what it's going to look like. But going 16 forward, as the damage prevention work for the day 17 is pulled together, the solution is going to be able 18 to go, well, the most efficient way for that work to 19 be delivered is to go to these jobs in this order, 20 and as result of that, we should see 2 1/2 percent 21 less miles driven and less time in the car getting 22 between those jobs. 23 Q. So it's essentially route optimization. 24 A. [JOHNSTON] It's route optimization. So</p>	<p style="text-align: right;">654</p> <p>1 and Mr. McNamara -- again, understanding that some 2 of it is operational, not GBE; but to the extent 3 they have mentioned some things about GBE, I'd like 4 to ask a few more questions. 5 On Page 6, starting on Line 5, there's a 6 question and a response about how the company is -- 7 well, I guess if you refer to the question above 8 it -- how the company is going to alleviate issues 9 arising from older technologies and systems through 10 the GBE. Do you see that? 11 A. [JOHNSTON] Uh-huh. 12 Q. And in the answer that starts on Line 6 13 there, there's a mention of the GBE program 14 providing real-time status of all field staff, map 15 locations for all work, and street-level routing. 16 A. [JOHNSTON] Uh-huh. 17 Q. Is that sort of what you were talking about 18 just now with respect to route optimization and so 19 forth? Is that related? 20 A. [IRANI-FAMILI] Yes. 21 Q. In particular, with respect to map 22 locations for all work: Is the company saying that 23 the new GBE system is going to have map locations 24 that are available for all work and all of those map</p>

655	<p>1 locations will be accurate?</p> <p>2 A. [JOHNSTON] I think what this is saying is</p> <p>3 that today our mapping system and our work</p> <p>4 management system and our mobility system are not</p> <p>5 well linked together -- and we heard for a long time</p> <p>6 this morning some of the frustrations and the</p> <p>7 challenges that that will provide.</p> <p>8 What we're going to be able to do</p> <p>9 through GBE is have our work linked to our GIS</p> <p>10 mapping system, so that we're able to see on the map</p> <p>11 where our work is; and to the extent that the</p> <p>12 information that we have in our legacy systems is</p> <p>13 accurate, then the information in the new systems</p> <p>14 will be accurate. To the extent that the</p> <p>15 information that the company has today has</p> <p>16 inaccuracies in it, recognizing this is a</p> <p>17 200-year-old business, then those inaccuracies are</p> <p>18 going to be transported across.</p> <p>19 What we're going to be able to do,</p> <p>20 though, in GBE, which I think is important, is the</p> <p>21 thing that helps us find inaccuracies in our records</p> <p>22 is our people. And so if you get to a site and are</p> <p>23 expecting to find something that's on the map but</p> <p>24 it's not there or you find something that wasn't on</p>	657	<p>1 digitally check where we've got errors and do</p> <p>2 something about that, that is part of enhancing the</p> <p>3 data as we move across.</p> <p>4 Clearly, if our -- I don't know -- our</p> <p>5 mapping system has a pipe on one side of the street</p> <p>6 and it turns out to be the other, the only way we're</p> <p>7 going to know that is when we dig a hole and go down</p> <p>8 on it.</p> <p>9 Q. A little further down in this same response</p> <p>10 on Page 6 here, Line 13, there's a mention of the</p> <p>11 rollout of iPads to employees. When is that rollout</p> <p>12 supposed to happen?</p> <p>13 A. [JOHNSTON] I would refer you back to</p> <p>14 the -- our testimony and the road map that we show.</p> <p>15 So very much like everything in GBE, we're rolling</p> <p>16 out the technology with the new solutions. So the</p> <p>17 iPad is the front end to GBE, so the Toughbooks that</p> <p>18 our employees so love today will be being got rid of</p> <p>19 and they'll be being replaced with an iPad. So that</p> <p>20 will start for Massachusetts in the CMS in December</p> <p>21 of this year, and then for our field operations</p> <p>22 crews they should expect to see that in 2020.</p> <p>23 Q. So it starts in Massachusetts in December</p> <p>24 of this year. How long is that part of it expected</p>
656	<p>1 the map, it's going to be far easier for our</p> <p>2 employees now to flag that back up, to get the</p> <p>3 records updated and changed, so that actually our</p> <p>4 records are going to get better over time.</p> <p>5 A. [IRANI-FAMILI] We also call that</p> <p>6 self-healing.</p> <p>7 A. [JOHNSTON] If Nick was here, he'd talk</p> <p>8 about self-healing the data.</p> <p>9 Q. So it's not part of the GBE program per se</p> <p>10 to correct the information that's currently</p> <p>11 contained in the old systems before that information</p> <p>12 gets moved over to populate the new systems?</p> <p>13 A. [JOHNSTON] So I think I should be</p> <p>14 really -- we are enhancing some of our data, where</p> <p>15 there's ability to do that. So there's a tool</p> <p>16 called Informatica, where we've maybe got missing</p> <p>17 fields, maybe we've got obviously things that are</p> <p>18 conflicting so we know that they're wrong, and</p> <p>19 quality that's helping us to understand where the</p> <p>20 data we've been working -- certainly in Rhode Island</p> <p>21 there was a great success story of working with the</p> <p>22 local Rhode Island team to enhance a number of data</p> <p>23 objects before we moved them into the new system.</p> <p>24 So where there's opportunities for us to</p>	658	<p>1 to take to roll out, the piece that's starting in</p> <p>2 December of this year?</p> <p>3 A. [JOHNSTON] It will happen at once for the</p> <p>4 CMS crews. So all CMS crews in Massachusetts will</p> <p>5 get the iPads when we go live on day one, and prior</p> <p>6 to that through the training.</p> <p>7 And I should formally, I guess, just say</p> <p>8 on the record: We're piloting the use of iPads in</p> <p>9 Rhode Island. We've not formally decided that's the</p> <p>10 solution that we're going to run with. We think it</p> <p>11 makes sense, but in everything that we're doing,</p> <p>12 we're checking and learning as we go.</p> <p>13 The nice thing about the solutions we're</p> <p>14 designing there, they're device-agnostic, so we can</p> <p>15 use any device.</p> <p>16 Q. If I could just quickly turn you to</p> <p>17 AG-21-8-1, that table attachment, please.</p> <p>18 A. [IRANI-FAMILI] Can you repeat that,</p> <p>19 please?</p> <p>20 Q. AG-21-8-1. And specifically to Page 6.</p> <p>21 There's an entry for something called time entry</p> <p>22 program.</p> <p>23 A. [JOHNSTON] Yes.</p> <p>24 Q. What is that?</p>

659	<p>1 A. [JOHNSTON] So the time entry program is 2 really looking for us today -- we talked a little 3 bit about it this morning, how at the end of the day 4 our employees are expected to fill out paper 5 timesheets and get their supervisors to sign off on 6 what they've done. The time entry program will be 7 able to prepopulate people's timesheets based on the 8 work they've completed that day. 9 Q. So is the expectation that people will 10 still be submitting paper timesheets after this time 11 entry program is implemented? 12 A. [JOHNSTON] I hope not. 13 Q. Is that a no, sir? 14 A. [JOHNSTON] Well, the ambition would be the 15 less paper we have in our business the better we'll 16 be. So there should be no need for us to have data 17 timesheets. So the ambition is, no, we will not 18 have paper timesheets. 19 Q. So is the time entry program supposed to be 20 the particular piece of GBE that would eliminate the 21 paper timesheets? 22 A. [JOHNSTON] That's correct. 23 Q. Then on Page 3 of that same document there 24 is an entry for ArcFM -- I'm sorry, in the rightmost</p>	661	<p>1 A. [JOHNSTON] No. That's gone. 2 Q. New England GIS is gone? 3 A. [JOHNSTON] Is going to be gone. 4 Q. Is going to be gone or is gone now? 5 A. [JOHNSTON] Is going to be gone. We heard 6 earlier today that we would be seeing the GIS 7 implementation for Massachusetts going in in 8 December of 2018. 9 Q. When was New England GIS first rolled out? 10 A. [JOHNSTON] Mid-1990s. 11 Q. The same time as the earlier ESRI? 12 A. [JOHNSTON] Same thing. 13 Q. Is it just different names for the same 14 software? 15 A. [JOHNSTON] Yes. 16 Q. Are you familiar with DigTrack? 17 A. [JOHNSTON] I am not familiar with 18 DigTrack. 19 Q. So you don't know whether that's one of the 20 pieces that GBE is replacing? 21 A. [JOHNSTON] My expectation based on the 22 conversations this morning, that DigTrack will move 23 into GBE. 24 Q. So when I asked whether you were familiar</p>
660	<p>1 column, I believe in the entry for ESRI, there 2 appears the words ArcFM GIS-NE. Do you see that? 3 A. I do. 4 Q. So the new ESRI implementation -- 5 A. [JOHNSTON] Is going to replace the old one. 6 Q. -- is going to replace the old one, and 7 it's also going to replace ArcFM GIS-NE? 8 A. [JOHNSTON] Yes. 9 Q. What is -- strike that. When was ArcFM 10 GIS-NE initially rolled out? 11 A. [JOHNSTON] If I can point you to the prior 12 response, so AG-21-7, and then if you look halfway 13 down, we have ESRI. The original ESRI that was put 14 in was in the mid-1990s. 15 So ArcFM Viewer is literally a front end 16 to allow you to see the 1990s ESRI. 17 Q. And is that different from New England GIS? 18 A. [JOHNSTON] They're all interlinked. So 19 the New England GIS is, I think, the underlying 20 ESRI. The ArcFM is, if you like, the window in so 21 that our employees can see what's in New England 22 GIS. So that's what we're getting replaced. 23 Q. Did I hear you right just now, that New 24 England GIS is the newer ESRI?</p>	662	<p>1 with DigTrack, you've heard of DigTrack, clearly. 2 A. [JOHNSTON] From this morning's testimony, 3 yes. 4 Q. Are you familiar with Dig Safe? 5 A. [JOHNSTON] I am aware of Dig Safe, yes. 6 Q. Do you know whether Dig Safe is going to be 7 part of the GBE implementation or is going to be 8 replaced? 9 A. [JOHNSTON] No, Dig Safe is remaining. So 10 referring to AG-21-8, on the appendix, and then on 11 Page 4, the third line, Dig Safe New England shall 12 remain. 13 Q. You said appendix. I think you mean 14 attachment? 15 A. [JOHNSTON] Attachment. Sorry. 16 MR. MERRITT: If I could just have one 17 moment to quickly look, see if I've missed anything. 18 MS. PIEPER: Sure. Let's go off the 19 record. 20 (Discussion off the record.) 21 MS. PIEPER: Let's go on the record. I 22 remind you you remain sworn. You may proceed. 23 Q. Just a few more items. I believe you heard 24 the testimony this morning about problems with the</p>

<p style="text-align: right;">663</p> <p>1 field technicians' laptops, the Toughbooks, and in 2 particular the connectivity problems they have. 3 A. [JOHNSTON] Yes. 4 Q. And there was testimony that the 5 connectivity problems are related to the Toughbooks' 6 reliance on 2G connectivity for wireless. You 7 recall that? 8 A. [JOHNSTON] I do. 9 Q. And there was testimony that those devices 10 are going to be replaced as part of the GBE. 11 A. [JOHNSTON] That's correct. 12 Q. What kind of connectivity will the new 13 devices that replace the old devices use? 14 A. [JOHNSTON] I should start by saying, 15 before GBE I ran customer meter services for 16 Massachusetts and the other jurisdictions and so 17 felt the challenges of connectivity every single 18 day. 19 The new solution is going to be, as we 20 said, device-agnostic, but we're going to be giving 21 folks iPhones or iPads, as you and I have today. 22 And so the connectivity will be as good as we have 23 on our smartphones, which we know is sometimes 24 really good and sometimes doesn't work.</p>	<p style="text-align: right;">665</p> <p>1 connectivity. It is the fact that at times we need 2 duct tape to attach the batteries so these devices 3 work. It's the fact that it takes minutes for it to 4 come up. It's the fact that -- think about the 5 computer you had at home 10, 15 years ago. 6 Those are also issues -- it's not just 7 about connectivity -- that we need to resolve for 8 public safety, for our customers, and for our 9 employees, because if any of us had to work in that 10 situation all day every day, imagine the frustration 11 that we would have. So it's not just about 12 connectivity. 13 Q. Well, Mr. Johnston, you've talked about the 14 offline component. 15 A. [JOHNSTON] Uh-huh. 16 Q. So I'd like to ask about that. You said 17 that a worker who has one of these new devices will 18 be able to get their information for their work in 19 the morning with connectivity, go out into the 20 field, where they might not have connectivity, but 21 they'll still have the information. 22 A. [JOHNSTON] Correct. 23 Q. That offline capability, however, is not 24 going to address the situation where someone is</p>
<p style="text-align: right;">664</p> <p>1 And so the important thing for the 2 solution, therefore, is that it works when you don't 3 have connectivity. It's important that we have a 4 tool that folks can get their work done whether 5 they've got cellular signal or not. 6 And so the solution that we're building 7 works offline, which means you need to have 8 connectivity to receive your work, but once your 9 work is on your device, you can run all day, 10 complete all your work without any signal 11 whatsoever. The maps are available, the information 12 you need to complete your work order is available. 13 And then the next time you get connectivity, that 14 work will go back up to the solution. 15 So connectivity is going to be better 16 than they've got today, it won't be perfect, but the 17 key point is that the solution enables people to 18 work when they haven't got connectivity. 19 Q. In terms of G's, are we talking about 4G? 20 A. [JOHNSTON] Yes, LTE. 21 A. [IRANI-FAMILI] I just want to -- you have 22 brought up connectivity as the only issue with these 23 devices. I just wanted to make sure that we are 24 clear that the devices' issues of today is not just</p>	<p style="text-align: right;">666</p> <p>1 working a change in the middle of the day. 2 A. [JOHNSTON] Correct. 3 Q. Is there any provision in the devices or 4 elsewhere in GBE to account for that problem, given 5 that connectivity may, as you say, still be an 6 issue? 7 A. [JOHNSTON] I'd be very interested in your 8 proposals around how we get work to a device that's 9 got no connectivity. Clearly, you know, the way 10 that we operate our business today is through 11 computers that don't have great connectivity. This 12 is going to be much better. But if someone's in a 13 place that they're out of cellular connection and we 14 can't phone them and they can't get things on their 15 computer, that is just a risk that we have to carry. 16 It's no different to the risk that we carry today. 17 It's going to be significantly better in this world. 18 But to the extent that you're aware of how we could 19 do it differently, I'd be very open to some 20 suggestions there. 21 Q. And what about the back-end systems that 22 drive information being transmitted to employees, 23 the mainframe systems? Are any of those going to be 24 updated or changed out as part of the GBE?</p>

667	669
<p>1 A. [JOHNSTON] So they're all being replaced. 2 That's the whole point of GBE. GBE started from me 3 working and listening to our union employees, 4 listening to Mr. Kirylo and his concerns around the 5 challenges going on. He's absolutely right, that we 6 have to make changes to our systems and modernize 7 them. 8 We started to look at could we just give 9 people modern computers and connect them into the 10 old systems? But the old systems and the age of 11 when they were put in were actually as much, if not 12 more, of a problem than the front-line computers 13 that folks were using. 14 So putting Maximo into place, putting 15 Salesforce in place effectively is removing or 16 replacing the old systems with putting it into the 17 cloud. It's going to put us onto modern 18 architecture that's going to remove ourselves from 19 the resiliency and the reliability issues that we 20 have today with the old system. 21 Q. Are there going to need to be any personnel 22 changes to account for all of the back-end systems 23 changing? 24 A. [JOHNSTON] Inevitably as there's changes</p>	<p>1 will have more employees looking after the new 2 systems than the old ones, because the old ones are 3 not being looked after; we're just keeping them 4 running. 5 Q. From an employee -- from a field employee's 6 perspective, however, the primary organization that 7 they will be interfacing with, it sounds like from 8 your earlier testimony, is the help desk. Is that 9 going to continue to be true? 10 A. [JOHNSTON] Yeah, that's correct. 11 MR. MERRITT: I don't think I have 12 anything further. 13 MS. PIEPER: Thank you. The Attorney 14 General? 15 FURTHER CROSS-EXAMINATION 16 BY MR. REPPUCCI: 17 Q. Mr. Johnston, I believe you testified a 18 little bit ago about the issue of some of the 19 systems you're implementing in GBE having new 20 features and new functions as they have updates. Is 21 that correct? 22 A. [JOHNSTON] There's that potential, yes. 23 Q. And you're going to have decision points 24 about whether to adopt those new features or</p>
668	670
<p>1 there will need to be changes, and we'll work 2 through those as we get there. 3 Q. So as you sit here today, are you expecting 4 that there are going to need to be, for example, 5 more employees brought on to -- more employees 6 brought on to work with the new mainframe back-end 7 systems? 8 A. [JOHNSTON] So there will be no mainframe 9 back-end systems. Everything is going to be 10 cloud-based. But as you look at the age of the 11 systems we have today, they're so old that the 12 majority of them are not able to be fully supported, 13 and we don't have teams to do that, because there 14 aren't upgrades coming to implement. 15 As we put modern, new systems in place, 16 it's going to be prudent for us to then have a 17 support organization to make sure that we keep those 18 systems up to date, the updates that you were 19 talking about, that we make sure that we're prepared 20 and ready for those, and that as we get feedback 21 from our employees using the systems on how to make 22 them even better for serving our customers, that we 23 have the capability to do that. 24 So absolutely I am expecting that we</p>	<p>1 functions based on whether they're cost-effective? 2 A. [JOHNSTON] And whether they deliver value, 3 absolutely. 4 Q. If you adopt these new features or 5 functions, are they going to be charged to the GBE 6 implementation costs, or are they going to be 7 charged to the run-the-business costs? 8 A. [JOHNSTON] This is, I think, one of the 9 real benefits of going down a SAAS model, is that 10 the new features and functions, effectively you get 11 them as part of the cost of the license, so you're 12 not paying incremental costs for them. So whereas 13 in a sort of traditional approach, where you're 14 building a solution on premise, anytime you want to 15 make enhancements you're making them on your dollar. 16 These enhancements come down, just like you get an 17 update on your iPhone to the next version of iOS. 18 So whether we choose to then implement 19 those with our field organization because we think 20 it will drive value, that would be an RTB -- a 21 decision based on the value that we think it's going 22 to deliver for our customers. 23 Q. So just to clarify: Any licensing costs 24 associated with those would be nothing.</p>

<p style="text-align: right;">671</p> <p>1 A. [JOHNSTON] They should be included in our 2 normal existing licensing. 3 Q. And in terms of any costs associated with 4 implementing new features and functions, would those 5 costs go to the GBE program costs or would they go 6 to the run-the-business costs? 7 A. [JOHNSTON] My expectation is that we want 8 to close the program as quickly as possible, and so 9 that would go to run-the-business costs. 10 Q. And that's your expectation; right? 11 A. [JOHNSTON] Yes. 12 Q. And just one unrelated question: Do you 13 know how many crews are on the road in Massachusetts 14 that you would need to be replacing all of those -- 15 and I apologize if I'm forgetting the word at this 16 point -- Toughbook systems for? 17 A. [JOHNSTON] So it's going to be in the 18 region of 1100. 19 Q. Approximately 1100. 20 A. [JOHNSTON] Approximately. 21 MR. REPPUCCI: One moment, please. 22 Q. One last question: How many union 23 employees do you have in Massachusetts? 24 A. [JOHNSTON] I don't have any answer to</p>	<p style="text-align: right;">673</p> <p>1 morning by the union, and I don't know if that was 2 going to be an issue. 3 MS. KIMBALL: What we will do is attempt 4 to do it in five days, and if we need more time, we 5 will request by motion for an extension. 6 MS. PIEPER: And I would also note that 7 to the extent that any of the record requests issued 8 by the union this morning are duplicative of 9 information provided in information requests or 10 testimony, you may simply cite to that information 11 request or testimony. 12 MS. KIMBALL: Thank you very much. 13 MS. PIEPER: Let's go off the record. 14 This hearing is adjourned. 15 (6:32 p.m.) 16 17 18 19 20 21 22 23 24</p>
<p style="text-align: right;">672</p> <p>1 that. 2 MS. PIEPER: I am confident that's in 3 the record. 4 MS. KIMBALL: It's in AG-1-44. We've 5 been over it several times here. 6 Q. Will every employee with a Toughbook now 7 get a replacement in Massachusetts? 8 A. [JOHNSTON] Everyone will get a device that 9 needs the device to complete their work. So the 10 assumption would be yes. Could we have someone 11 today that has a Toughbook somewhere that really 12 doesn't need it to do their work? Then we wouldn't 13 replace that. So they will be provided to people 14 that need devices to complete their work. 15 MR. REPPUCCI: We have no further 16 questions. Thank you. 17 MS. PIEPER: We have no further 18 questions. 19 Do you have any redirect? 20 MS. KIMBALL: No, thank you. 21 MS. PIEPER: Before we go off the 22 record, I wanted to note that pursuant to the ground 23 rules, all the record requests should be received by 24 five business days. There were quite a few this</p>	<p style="text-align: right;">674</p> <p>1 REPORTER'S CERTIFICATE 2 3 I, Alan H. Brock, the officer before 4 whom the foregoing proceedings were taken, do 5 certify that this transcript is a true record of the 6 proceedings on May 10, 2018. 7 8 9 10 _____ 11 Alan H. Brock, RDR, CRR 12 13 14 15 16 17 18 19 20 21 22 23 24</p>

675		677	
1	I N D E X	1	Record Request USW-16 amendment..... 442
2		2	Record Request USW-17 461
3	EXAMINATIONS	3	Record Request USW-18 467
4	AMY S. SMITH AND DANIEL F. MCNAMARA	4	Record Request USW-19 468
5	MS. BLACKMORE 395	5	Record Request USW-2 404
6	MS. DECTER 399	6	Record Request USW-20 474
7	MR. ROGERS 487	7	Record Request USW-21 474
8	MS. DECTER 505	8	Record Request USW-22 478
9	DAVID E. TUFTS, PAMELA E. BUSHMICH, AND DANIEL	9	Record Request USW-23 480
10	S. DANE	10	Record Request USW-24 484
11	MS. BLACKMORE 507	11	Record Request USW-25 503
12	MR. ROGERS 509	12	Record Request USW-26 506
13	MR. WAGNER 512	13	Record Request USW-3 405
14	MR. DIAZ 516	14	Record Request USW-4 408
15	MR. OSBORNE 524	15	Record Request USW-5 409
16	MR. ROGERS 527	16	Record Request USW-6 411
17	MR. ROGERS 531	17	Record Request USW-7 415
18	PETER E. DAWES	18	Record Request USW-8 416
19	MS. BLACKMORE 532	19	Record Request USW-9 419
20	PETER E. DAWES AND DANIEL S. DANE	20	
21	MS. ANDERSON 533	21	CONFIDENTIAL PORTIONS - None
22	ANTHONY H. JOHNSON AND REIHANEH IRANI-FAMILI	22	
23	MS. BLACKMORE 556	23	
24	MR. REPPUCCI 560	24	
676			
1	MS. LUKSHA 615		
2	MR. MERRITT 625		
3	MR. REPPUCCI 669		
4			
5	EXHIBITS MARKED		
6	NG-1..... 527		
7			
8	RECORD REQUESTS		
9	Record Request AG-10 545		
10	Record Request AG-11 547		
11	Record Request AG-12 555		
12	Record Request AG-9 538		
13	Record Request DPU-10 524		
14	Record Request DPU-11 620		
15	Record Request DPU-8 521		
16	Record Request DPU-9 521		
17	Record Request USW-1 403		
18	Record Request USW-10 427		
19	Record Request USW-11 434		
20	Record Request USW-12 437		
21	Record Request USW-13 439		
22	Record Request USW-14 439		
23	Record Request USW-15 440		
24	Record Request USW-16 441		

<p>A</p> <p>\$144,576 531:14 \$2,633,434 609:16 \$25 610:21 \$458.1 611:23 \$73 553:8 \$80.5 617:16,20 \$9,108,712 610:4 A&G 534:9,16,19 535:17 536:7 538:12 538:15 540:14 541:14 542:15 543:13 547:13 549:17 553:9 A&G-related 549:4 a.m 390:8 393:1 abandoned 451:16 ability 640:15 653:14 656:15 able 406:8,9,10,12 413:3 415:22 418:1 418:13 420:22 422:2 425:7 426:7,7 430:3 438:7 449:13,15 450:1 452:2 453:15 454:1 456:11 461:3 467:8 470:1 480:5 493:5,22 494:4,5,8 494:16 503:23 566:12 579:24 580:12 582:24 583:10,11,18,19,22 583:23 584:15,18 594:15 598:3 599:20 599:24 600:2 608:21 612:1 619:18 624:18 627:1,10,22 628:3 630:23 633:1,8 645:14 649:3 652:17 655:8,10,19 659:7 665:18 668:12 absence 419:10 absolutely 445:19 452:23 457:18 467:10 473:23 565:9 605:1 644:17 647:4 647:14 667:5 668:24 670:3 accelerated 526:3 Accenture 567:5,9 605:17 613:8 650:24 651:20,22 Accenture's 651:10 652:3 accept 539:11 access 406:1,8,9,10,12</p>	<p>406:17 407:9 411:15 412:1,4,12 415:22 417:10 419:21 420:2 425:23 429:15 430:1 430:4 432:12 490:9 493:5 586:12 589:21 635:2 accessible 428:14 accessing 430:5 432:17 accidentally 475:22 475:22 accommodation 646:3 account 495:20 530:9 530:11,17,20 536:24 537:5 541:19 542:2 542:21 545:15,17 546:2,5 547:21 548:1,13 550:14,17 552:3,5 553:15 666:4 667:22 accountability 434:24 accountable 560:15 accounting 495:11 496:11,21,23 497:17 498:12 532:19 545:9 546:17 547:3 548:12 646:4 accounts 495:19 496:23 497:16 530:2 530:10 536:8 541:19 547:17 549:7,21 550:7 552:3 553:2 553:10,12,24 accumulate 606:17 accuracy 432:8 439:8 439:13,17 502:11 504:9 653:9,9,23 accurate 432:6 433:18 434:24 445:17 446:10,16,18,19 488:7 500:16 655:1 655:13,14 accurately 446:13 acknowledges 424:19 act 510:5 614:7,10 action 468:24 actions 425:11 469:6 activities 495:4 534:9 543:5 565:19 580:8 580:9 activity 495:12 496:1 496:1 497:7 498:1 499:13,19,23 500:4 603:5</p>	<p>actual 430:20 465:22 479:5 505:5 525:2 537:21 553:4,12 612:24 actuals 613:6 617:11 619:2 adapt 481:1 487:9 add 452:22 483:8 497:18 620:14 627:6 633:16 added 448:11,15 503:12 505:5 645:22 adding 527:21 addition 399:20 402:18 425:19 457:23 458:3,13 459:18 460:10 465:21 497:18 501:10 518:13 541:8 601:20 additional 438:6,7 439:10,12,15 454:9 458:1 483:5,6,8 484:11,12 503:21 504:18 519:5 593:9 612:10 619:3 648:11 additions 397:6,21 398:22 508:6 533:10 547:5 557:10 558:1 559:2,17 address 425:16,18 480:11 490:10 501:2 554:23 562:8 594:15 630:3 632:15 638:21 649:5 653:11,17 665:24 addressed 423:17 addresses 480:9 653:20 addressing 414:2 415:4 adequate 482:23 484:9 adjourned 673:14 adjust 513:2,20 604:5 adjustment 513:8,11 513:17 538:12,16 547:3 549:6 552:7 552:12 adjustments 510:14 517:20 523:2 538:16 544:12 547:10,12 administrative 534:3 534:17,20 537:1 543:3 547:23 administratively 542:24</p>	<p>adopt 669:24 670:4 adverse 482:19 483:7 advisers 527:20 advisories 473:10 Advocacy 392:7 affidavits 561:9,20 affiliates 563:11 affirmed 395:16 507:2 532:7 533:18 555:22 afternoon 488:2 509:8 533:23,24 560:5 563:22 571:7 575:14 625:3 AG's 394:17 AG-1 515:9 AG-1-44 672:4 AG-10 545:6,12 676:9 AG-10-18 458:5 459:18 AG-11 546:24 547:1 676:10 AG-12 555:5,6 676:11 AG-19-8 631:15 AG-21-14 611:7 AG-21-15-1 605:13 613:9 AG-21-27 578:11 580:24 AG-21-4 564:13 AG-21-5 561:8 AG-21-5-1 562:22 AG-21-7 660:12 AG-21-8 569:1 594:23 662:10 AG-21-8-1 569:10 575:10 580:15 587:18 658:17,20 AG-27-20-17-1 650:1 AG-9 538:3,4 676:12 AG-RRP-Suppleme... 516:14 age 423:10,10,19 667:10 668:10 aged 431:18,24 432:13 agents 586:8 agile 598:21 599:3 604:3 agile-style 600:4 aging 424:11 ago 441:17 451:17 464:11 469:7 500:17 527:4 646:17 665:5 669:18 agree 401:19 404:17 418:19 423:21</p>	<p>431:22 446:4,15 450:12 451:15 469:9 471:16,19 473:13 474:8 482:1 484:24 515:20 520:1,2 522:4 547:9 636:17 agreed 474:11 539:24 540:2 agreement 400:14 445:3 484:18 485:1 485:5 486:9,10 agreements 464:5,7 ahb@fabreporters.... 390:21 ahead 518:17 519:24 521:10 632:4 644:23 air 491:23 Alan 390:20 410:18 500:19 674:3,10 Alexandra 391:14 alexandra.blackmo... 391:20 algorithm 651:15 all-hands-on 486:12 alleged 478:10 alleviate 448:12 654:8 allocate 541:12 allocated 450:23 610:14 616:12,14,21 allocated-cost-of-se... 394:10 allocation 550:12 allotted 405:17 allow 419:14 429:14 588:18 589:20 604:12 607:17 642:23 660:16 allowed 526:2 611:21 allows 408:6 611:22 634:10 alongside 471:15,16 already-loaded 543:23 alternatives 424:1 altogether 429:19 ambition 659:14,17 amend 442:10 480:16 amendment 442:16 677:1 amortization 530:5,16 531:4,18 amount 416:19 450:15 515:13 518:23 523:4 527:19 536:2 539:20 547:6 550:4,5 552:22 553:7 596:6 633:7</p>
--	---	--	---	---

<p>amounts 548:9 552:9 553:5,7,13 Amy 395:13,15 635:20 675:4 analysis 423:3,6,9,14 424:9,14,21 469:4 535:8 537:7,19 547:16 552:14 629:23 630:12,20,22 631:2 648:16,17,19 649:8,9 analytical 536:6 analyze 630:23 and/or 421:16 Anderson 392:3 533:22 534:1 546:22 555:7 675:21 Andrea 391:15 andrea.keeffe@nati... 391:21 announced 418:8,16 annual 467:17,18 546:9,21 607:3 608:5 609:14,16,17 609:19 610:4,23 answer 408:6,17 413:8,18 417:15 450:1 453:15 454:2 454:15 456:11 462:7 470:2 474:14,17 485:11 494:17 513:14 544:23 546:11 571:20 579:3 581:2 608:24 613:24 616:24 617:4,6 619:8 628:11 630:5 638:11,17 641:8,9 641:13 645:3 654:12 671:24 answered 459:21,22 526:23 561:21 answers 403:1 453:12 Anthony 555:18,21 675:22 anticipate 646:8 anticipated 560:19 569:16 579:12,20,21 581:19 588:10 589:10 590:8 591:20 592:14 593:1 604:1 606:17 anticipation 602:22 anybody 505:4 anytime 471:22 670:14 anyway 639:6</p>	<p>apart 652:3 apologies 522:13 636:9 apologize 422:8 440:1 441:22 445:9 571:11 575:7 586:14 588:2 611:4 671:15 app 627:12 apparently 441:14 appear 521:11 546:8 APPEARANCES 391:1 appears 550:21 610:2 640:20 660:2 appendices 537:16 appendix 662:10,13 application 408:14 409:4 414:17 applications 489:4 568:2,8,16 569:6,13 577:22 587:24 593:12 applied 518:24 520:9 553:11 applies 411:19 519:7 519:17 apply 544:12 648:20 appointments 583:22 583:23 appreciate 408:4 422:7,22 433:23 438:22 439:14 449:17 approach 486:13 604:2 610:10 627:4 628:6 670:13 approaches 565:24 appropriate 434:6 450:14 472:23 473:13 495:11 513:12 566:17 596:8 approval 393:9 496:3 approve 524:12 approved 464:19 497:4 approximate 417:18 418:7 419:15 468:21 525:21 526:21 approximately 396:8 401:20 420:20 443:23 451:17 455:14 466:21 469:11 475:18 526:15 553:8 671:19 671:20 approximation 462:3</p>	<p>April 396:22 404:13 404:18 411:6 451:19 507:22 535:11 536:19 557:1 609:15 ArcFM 405:14 624:7 659:24 660:2,7,9,15 660:20 ArcGIS 404:13,22 405:9 406:23 429:18 451:10,16 architecturally 642:2 architecture 623:11 642:3 667:18 archived 429:15 area 405:4 412:12 413:1 420:17,17,18 420:18 425:6,7 448:11 455:10 466:21 488:21 495:22 516:22 547:23 548:5 621:24 areas 421:10 430:10 430:12 444:4,5 455:20 536:8 540:11 541:19,20,22 542:22 543:3,3 621:6 argue 626:4 632:17 arising 654:9 arose 536:4 arrangement 528:21 529:3,11 arrangements 567:12 596:10 arrived 524:17 618:15 arriving 480:5 Arsenault 390:22 Article 484:17 486:5 Ashburton 392:8 Ashley 391:4 392:4 ashley.gagnon@sta... 392:14 aside 425:9 638:11 asked 405:7 421:22 429:22 435:2 451:9 460:6,6,11 486:16 503:22 527:20 561:9 564:10 569:4 595:3 603:18 608:4 609:2 620:1 639:3,4 649:23 661:24 asking 403:24 408:2 414:7,11 454:13 460:22,23,24 479:24 480:2,3 485:10 515:8 607:10 641:1 aspect 479:5</p>	<p>assertion 484:24 assess 480:5 534:7 649:3 assessment 477:16,20 536:7 596:6 626:19 648:9 650:23 651:5 assessments 639:15 asset 530:3,24 531:5 578:18 586:4 595:11 621:7,11,13,17 622:4,5,21,22 623:1 assets 621:18 622:4 assigned 476:20,24 477:7 478:9,15 480:9 assignment 443:7 476:14,15,17 assist 435:11 453:3 480:20 assistance 438:6,7 640:1 Assistant 392:6 560:6 assisting 453:23 associated 459:8 463:8 482:16 490:14 492:7,11 495:12 497:20 499:4 525:10 537:19 548:11 554:2 554:2,5,6 574:8,12 575:1 576:1,17 577:16 670:24 671:3 assume 515:24 563:7 assuming 461:17 464:19 617:2 assumption 672:10 assumptions 538:10 assurance 399:14,18 399:22 400:9,21 466:8 623:14 assurances 474:3 attach 665:2 attached 594:24 attachment 569:9,10 570:12 575:10,16 577:22 578:2 580:15 587:18,21 590:18 605:13 613:9 615:24 618:6,15 624:3,7 649:24 658:17 662:14,15 attachments 561:10 attempt 425:16 673:3 attention 433:6 439:23 470:16 631:14 635:18 640:16 649:24</p>	<p>attested 607:11,15 Attorney 392:16 397:11 455:12 503:3 503:22 528:21 529:1 557:15 559:7 560:1 560:6 615:10 669:13 Attorneys 392:6 attrition 449:8 454:16 455:5,8,13,23 457:9 audit 465:14 548:7,11 audited 433:24 auditors 548:12 audits 434:4,9,9 465:18 August 564:7 automatically 497:20 498:9 autoscheduling 651:13 availability 427:21 453:16 available 399:2 406:20,21 407:1,6,8 407:11 412:22 414:17 419:8 420:5 424:2 426:5 428:20 428:21 429:24 430:7 438:14,21 453:2 461:2 467:22 486:15 494:8 505:4,16 509:3 533:14 559:24 585:18 594:18,20 633:18 634:24 635:1 635:10,15 638:17 639:8,19,24 654:24 664:11,12 Avenue 392:20 481:5 481:7 average 411:2,3 502:5 502:6 526:21 avoid 449:24 awagner@keeganw... 391:10 award 517:5 aware 404:20 411:20 414:21 415:12 417:1 417:3 423:6,9,15,18 424:13,19,20 425:14 426:9 431:16 432:18 432:21 433:13 434:3 439:11 441:8 447:22 448:7,10 452:14 454:16,19,23 455:11 461:19 464:8,17 468:11,14 472:11,15 476:19 478:14,17 482:13 483:14,22</p>
---	---	--	--	--

610:5,7 611:20 644:20 662:5 666:18	659:7 661:21 670:1 670:21	560:19 599:13 604:2 606:13,16,24 607:4 612:2,4,11,12 615:3 650:3 651:2,4 670:9	619:21 620:7 650:3 650:8	675:9
B	baseline 650:15	best 401:11 429:7,21	bottom 453:1 549:15	business 393:7 400:20
B 640:20,21	basically 629:18	435:2 461:5 462:6	572:15 631:8 636:1	412:7 423:17 442:23
bachelor's 566:21	basis 400:24 417:12	492:18 493:2 600:3	boundaries 645:7	442:24 443:3 491:20
back 405:23 410:17	465:10 501:16 545:8	639:21 651:16	box 586:24 587:5,5	492:7,11,15,19,22
422:15 437:23 445:5	599:11 617:15,19	better 409:18 427:13	600:19	493:3,17,24 494:16
445:9 451:5 457:3	batteries 665:2	485:12 493:6 536:6	Braintree 468:15	494:18 501:14 543:4
470:22 500:20	battery 633:22	633:5,8 656:4	469:10,14	556:7,16 558:8,9
502:20 503:1 504:15	bear 537:3 548:19	659:15 664:15	brand 472:7	560:13 564:2 565:5
504:16 506:13	553:3 571:6	666:12,17 668:22	brand-new 456:19	565:8 566:2,3,5
510:15,20 512:19	began 505:20 564:5	beyond 456:17 457:19	461:22	567:2,13 568:3
514:5 518:20 525:10	beginning 393:20	477:2,10 582:20	breach 475:22,23	578:18 579:1 581:8
526:11 528:4 532:2	425:12 535:3	597:11 602:16	476:1	581:13 588:19
536:15 555:14 575:9	begins 510:17 595:10	603:12,23 604:7	break 394:15 422:14	589:17 599:15
575:10 580:14	595:11	611:22 620:9 633:24	449:4,13,21 450:18	605:11,15,16 612:12
585:21 587:16,23	behalf 610:20 636:21	bid 516:22	450:20,22 451:24	613:9 631:23 632:14
588:3 603:18 605:2	believe 401:10 407:12	bidding 455:1	452:5 457:21 476:2	636:20,21 637:13,14
608:1 612:14 613:8	411:21 414:15	big 428:12 597:12	492:1 500:7 502:22	638:7 639:17 645:21
613:21 614:23	415:13 416:8 422:4	bigger 640:7	503:4,24 555:13	647:8,12 648:7
616:22 617:2,4	426:22 427:13 429:5	bit 488:10 566:20	596:13 597:22,24	651:8 655:17 659:15
619:24 621:17	430:9 432:7 435:7	574:5 625:9 628:12	613:19 642:23	666:10 672:24
626:21 629:21	436:1 441:9 443:8	629:6 632:4 642:2	breakdown 595:3	businesses 541:7
632:21,22 633:1,4	445:13 448:14,22	659:3 669:18	597:10	563:20 568:17
633:19 639:2 653:24	452:16 455:12	Blackmore 391:14	breaking 612:22	C
656:2 657:13 664:14	457:20,24 460:6,8	395:21,23 399:1	briefly 547:20	C 392:19 393:2
back-end 666:21	463:8 464:3,11	461:7 507:9 509:2	bring 426:7 589:17	518:11 640:20,22
667:22 668:6,9	466:20 468:15,19	532:12,14 533:13	broad 453:3 548:20	641:1
back-office 547:23	469:4,6 477:18	556:2 559:23 675:5	548:21,23	calculate 515:12
backfilling 455:2	483:15 491:2,7	675:11,19,23	broader 649:15	520:12 525:2
background 481:2	496:19 502:4 511:2	blackouts 416:14	broadly 636:2	calculated 424:15
566:21	513:24 519:22	537:10 538:6 539:13	Brock 390:20,22	514:16,18,22 552:24
backlog 436:9 446:24	524:15 530:6 534:2	545:24 546:11 548:9	674:3,10	650:21
447:2 448:12 450:8	552:19 554:9,19	549:11,11 551:20	broken 599:4 620:7	calculates 424:21
450:13 500:12,13	562:1,2 576:4	552:19 554:9,19	brought 420:9 426:1	calculating 519:1
504:2,4,23	577:12 579:18	552:19 554:9,19	540:8 629:7 664:22	calculation 519:7
backlogs 445:10,13,16	582:12 592:16	Bognano's 479:1	668:5,6	520:21,23 523:9,18
447:14	608:16 613:11 631:4	bonus 524:23	build 585:11 599:8	553:4 608:12 609:11
backward-looking	633:20 647:14 660:1	book 525:3,21 526:19	610:9	619:11 620:11
646:12	662:23 669:17	526:20,22 583:22	building 448:12 601:9	650:15
bad 519:17 521:7	believed 542:12	booked 497:13,23	615:19 664:6 670:14	calculations 523:6,9
balance 546:8 640:13	belong 471:5	booked-straight-line	built 598:24	527:22,22 538:10,21
640:14	belts 602:4	526:4	bulk 550:18	538:22 620:15,16
band 475:10	bench 393:12 485:11	BOS 517:21	bunch 418:2 651:17	calendar 570:2 619:5
bargaining 400:3,14	485:12 506:5 512:16	391:7,11,22 392:9	bundled 597:18,20	620:2
445:2 464:5,20	512:21 531:21 615:7	392:21 393:5,18	burn 481:22	call 403:10 453:12
468:4 484:18 485:5	benchmarking 540:13	402:20 405:15	burned 487:6	476:16 582:3,16
base 393:9 510:9,12	benefit 544:1 647:18	422:18 461:20 462:1	Bushmich 506:22,22	583:4,4,10,14 584:1
513:20 517:24	647:24 650:8,15	463:13,15 464:9,11	506:24 507:12,14,19	584:6,14,16,18
based 421:10 450:15	benefits 541:14	510:9 511:3 512:3	507:23 508:4,9	585:2,24 586:7
472:20 477:5 482:14	543:20 551:7,19,21	517:9,13,17,21	509:8,11,14,20,23	599:4 621:23 626:16
483:17,18 497:17	551:23 552:13,15,16	519:15 521:4 522:3	510:2,7,11,16,21	629:17 634:24
498:4,24 541:15	552:23 553:21,23,23	522:8,18,21 523:14	513:5,10 516:21	648:13 656:5
547:12 549:19 553:6	554:2,5,13,20,22,23	526:11 541:8,13	517:4 524:10,15,21	called 404:13 479:8
592:18 599:7 613:3		610:1,4,24 616:7	525:14 526:1,13,17	483:6 485:17,18
		617:1 618:19,21	527:16,20 528:6,14	489:10 600:7 642:5
			529:19,24 531:19	

<p>656:16 658:21 calling 518:23 calls 582:3 cap 612:10 capabilities 429:16 594:14 596:12 601:22 613:13 630:15,17 632:8 644:10 647:9 capability 631:5 665:23 668:23 capex 497:17 499:5 617:17,24 capital 497:20,24 498:13,18,19,22 499:2,8,10,14,17,20 499:24 500:4 518:8 519:13 520:2 522:3 522:20 523:4,19 542:20,21,22,23 543:1 545:22 546:4 614:8 615:17,20 617:19 618:4,11 619:6,11,13 620:9 capitalizable 497:8 554:4 capitalization 518:10 550:13 552:14 capitalize 544:3 549:20 capitalized 497:13 540:14 542:13 543:6 545:21 550:17 551:4 553:6 capitalizing 543:11,13 captured 552:16 553:23 554:13 captures 416:7 car 652:21 653:2 card 490:8 cards 407:10 care 404:3 551:11 552:4 553:15 554:7 career 463:15 Carol 390:14 393:11 Carolina 394:4,5 carry 666:15,16 cascade 449:24 case 396:4,10 397:12 398:11 448:20,24 459:11 485:16 492:6 508:20,24 510:13 511:4 519:19,22 532:18,19 537:9 538:13 556:12 557:16 558:14 559:8 562:17,18 605:12,16</p>	<p>610:16 612:12,17 613:9 614:3 615:3 646:7,12,12 cases 561:6 562:12 564:16 cash 522:19 523:4,18 cast 481:11 catches 549:3 categories 433:16 548:20,21,23 602:8 categorize 621:5 category 447:22 cause 424:3,8 469:5 caused 423:4 542:11 Cecile 390:12 393:13 cell 413:1 491:22 514:15,17 515:1,11 515:20,22 516:2 cellular 664:5 666:13 center 443:20 582:3 582:16 583:4,4,11 583:14 584:1,6,15 584:16,18 585:2,24 586:7 621:23 centers 535:16 536:6 536:22 542:1 certain 395:2 406:11 415:18 418:7 454:24 467:19 496:21,22 497:19 498:20,24 536:8 539:19 542:21 545:7 551:7 569:4 certainly 418:10 423:16 537:22 538:22 549:2 586:8 598:16 656:20 CERTIFICATE 674:1 certify 674:5 cetera 400:22 432:4 chain 623:4 chairman 627:20 challenges 603:8 655:7 663:17 667:5 challenging 602:22 chance 578:13 change 429:7 449:16 510:17 517:24 529:10 530:6,10,18 531:1 543:7 545:9 546:17,17 552:15,22 565:11,15,16,19 566:9 619:17 622:19 622:19 625:18 628:15 629:14 631:23 632:14,16,17 632:17,18 633:6</p>	<p>639:15 643:11 646:24 648:4 649:11 649:16 666:1 changed 418:22 516:2 550:12,15 573:24 574:2 604:20 608:6 609:20,22 610:23 656:3 666:24 changes 393:21 397:5 397:20 398:1,21 450:13 508:5 510:8 510:11,24 511:5 513:22 517:10,15 533:9 539:14 551:3 557:9,24 559:1,16 602:24 603:13,20,21 614:10 642:9 645:16 647:3,7 667:6,22,24 668:1 changing 552:13 580:6 614:1 629:24 644:12 645:1 649:18 667:23 Chapter 393:8 characteristic 497:6 characteristics 488:13 499:1 characterization 641:4 characterize 410:7 charge 394:9 499:3 521:4 542:22 543:1 548:1 565:14,16 608:5 609:14,16,17 609:20 610:4,24 626:2 charged 442:20 499:14,19,24 500:4 536:24 537:5 541:19 548:5 574:16 575:5 576:5 577:18 591:4 591:6,9 615:11,12 615:14,15 616:7 618:7 670:5,7 charges 510:5 charging 497:22 542:2,19 chart 497:16 569:12 569:19 570:1 579:13 581:19 589:9 590:8 591:20 592:14,24 593:20 594:24 595:4 595:10,21 598:5,15 600:14 chase 418:17 check 401:19,21 404:17,19 421:19</p>	<p>422:16 426:23 434:6 439:11 440:9 447:19 449:2,7,20 451:15 451:20,24 452:5 457:20 465:24 469:9 469:13 473:16 482:1 482:4 503:4 504:5,7 504:13 519:10 537:22 561:23 617:3 617:18 620:1 657:1 checked 450:23 503:7 checking 536:12 658:12 checks 433:24 434:13 465:15 503:21 chemical 566:22 Cheryl 391:3 choose 647:10 651:17 670:18 circumstances 447:13 448:1 468:11 cite 447:8 673:10 City 585:19 600:22 ckimball@keeganw... 391:9 claimed 492:10 clarification 394:24 560:12 569:24 571:4 585:14 589:23 594:10 608:15 clarify 395:3 421:1 461:7 468:2 516:9 543:16 552:11 562:10 564:19 571:5 571:22 577:15 578:24 582:10 585:20 590:15 593:10 594:19 595:14 609:13 613:8 613:12 646:17,21 651:19 670:23 clarifying 570:11 648:24 clarity 405:10 class 629:17 classifications 455:1 458:23 459:2,4 460:15 461:3 classroom 402:2,12 402:15 405:13 440:3 440:12 465:3,6 626:17 629:16 claw 612:14 clear 430:6 449:23 483:16 498:21 529:22 575:15 664:24</p>	<p>clearing 542:21 clearly 499:5 622:21 637:22 645:10 657:4 662:1 666:9 clerks 429:1 click 515:21 clients 567:8 close 610:21 671:8 closed 547:7 closely 644:9 cloud 667:17 cloud-based 668:10 CMR 393:8 512:8 607:18 CMS 421:3,5,7 587:5 630:17 657:20 658:4 658:4 CNM 486:10 coating 478:16 code 479:10 643:6,7 codes 495:19 coincidental 519:22 COL 520:18 cold 482:6,11,13,16 482:18,23 collaborative 540:19 colleague's 639:17 colleagues 492:1 494:15 603:16 collected 536:11 collections 580:7 601:23 628:19 630:17 collective 400:3 464:5 464:20 484:18 485:5 collectively 405:24 colloquy 455:12 Colonial 390:9 391:11 391:22 393:6,18 402:21 405:15 463:13 510:10 511:3 512:3 514:18 517:9 517:14 519:8,18 521:4,20 523:14 526:12 538:7 541:9 541:13 609:14,17 616:7 617:1 618:21 619:22 620:7 650:4 column 517:17 518:11 518:11,12 521:3 522:6 587:8 606:10 619:13 650:7,9,15 660:1 columns 620:6 combination 617:17 come 444:10 502:20 555:13 605:10</p>
--	--	---	--	---

630:18 632:21 633:1 633:13 635:11 644:16 647:10,21 653:21 665:4 670:16 comes 394:4 428:23 436:13 633:9 647:1 coming 428:15,15,16 429:18,19 452:23 483:2 514:5 539:21 583:21 631:6 633:3 645:16 668:14 commence 516:19 commencing 390:8 425:10 Commercial 475:1,15 476:20 477:21 478:9 479:21 Commission 562:12 611:12 Commissioner 390:12 390:13 Commissioners 393:13 commit 514:1 commitment 603:2 commitments 631:9 committed 422:9 632:9 committee 539:19 common 491:17 542:20 COMMONWEAL... 390:2 communicated 473:12,20 communication 432:23 473:17,19,21 473:22 490:20,24 491:5,22 649:6 communications 433:2 491:8 492:16 492:23 commute 426:2 companies 412:5 512:4 519:21 520:3 520:5,10,17 538:12 541:9,13 544:13,16 569:7 608:5 616:9 company 390:9,9 391:11,11,22,22 393:6,6,17 400:8 402:24 403:13,15 404:11 405:1 408:16 408:21,23 409:2 411:20 412:19 413:9 413:14,22 414:24 416:2,5,7,19 418:10	418:18 419:2 420:14 421:11 423:3,15,18 424:15,18 425:11,14 426:10,13,17,22,24 427:1 429:1 433:3 433:10,24 434:7,12 435:4,12,15 439:8 440:7 453:22 454:4 454:9,20,21,23 455:5,20,22 456:1,3 456:5,8,15 457:14 460:1,3 463:7,16,19 463:23 464:18 465:3 465:5 468:20 469:1 471:2 472:7 474:3 474:18 477:1,6,9,12 480:20,23 481:9 482:9,22 483:1,3 484:1,8,14,21 486:13 487:2 488:3 489:5 491:4,7 492:6 495:4,10,15 496:6 501:18 502:11 507:15 508:13 510:6 510:21,23 511:4 513:2 525:23 526:2 526:5,6,10 527:3 530:8,15 532:17 535:8,11 539:8,11 539:14 540:4 541:3 541:4,8,11 543:6 544:17 545:3,20 546:7 549:5 551:2,7 552:4,24 556:7 558:7 561:19 562:17 570:22 571:14 572:2 572:13,17 573:1,8 575:20 576:12,22 583:24 586:19 609:15 610:3 612:18 618:7 632:8 634:17 651:21 654:6,8,22 655:15 company's 400:12 423:11 427:19,23 428:6 431:6 434:11 453:2 454:17 476:13 476:16 483:24 484:18 487:3 488:5 490:4 494:21 495:5 498:12 502:2 516:2 525:14 537:19 547:10,11 552:7 562:23 580:1 612:16 comparing 520:19 521:17 522:7 523:17	comparison 515:16 compensation 552:1 competitive 516:18,22 compiles 426:14 complain 625:14 complaints 417:2 433:10 453:22 complete 425:24 428:23 501:7 537:11 580:5 583:10 584:17 585:2 603:4 627:2 664:10,12 672:9,14 completed 407:15 446:20 450:16 489:18 501:3,10,12 501:16,20,24 580:9 629:3 659:8 completely 594:16 624:15 634:2 completing 535:20 540:21 completion 407:17 408:9 429:10 complex 577:13 586:24 602:21 complexity 640:8 641:16 compliance 398:6 513:4,7,21 component 618:1,19 665:14 components 566:11 composite 522:23 comprehensive 441:2 441:12 493:7 625:19 625:23 626:3 631:9 632:9 computer 419:7 424:11 488:17,19,23 628:24 637:8 641:24 642:1 651:15 665:5 666:15 computers 412:1 415:23 416:4 417:4 417:6,20 419:3 422:23 491:18 494:1 495:23 666:11 667:9 667:12 concept 602:2 concern 637:11 638:22 642:10 concerned 603:17 concerning 390:8 432:19 433:2,11 453:15 470:18 471:1 473:10 475:1 561:10	concerns 431:6,9 637:17 667:4 concrete 425:11 439:7 628:13 652:8 concurrently 587:2 concur 539:8 conditions 483:8 conduct 406:1 conducted 423:7 424:14 434:4,9 conductor 472:3 confer 394:14 503:23 518:16,18 519:23 521:9 590:10 607:23 confident 672:2 confidential 395:5 605:21,22,23 606:1 606:2,6 677:21 configuring 645:7 confirm 394:6,8,12 407:5,19,21 415:1 416:7,9,10 422:20 435:24 448:20 449:11,13,16 460:12 474:7 480:3 577:23 618:3 620:8,18 confirming 618:18 conflicting 656:18 conjunction 442:19 471:6 connect 413:3 472:8 667:9 connected 471:8,12 471:13,14 641:24 642:6 connection 666:13 connections 573:16 connectivity 410:4 411:14 412:21 413:5 414:8,13,20 415:18 416:3,17 417:2 420:8 423:5,8 424:3 424:10,16 425:12,21 494:7 663:2,5,6,12 663:17,22 664:3,8 664:13,15,18,22 665:1,7,12,19,20 666:5,9,11 connector 474:5,19,19 connectors 472:8,13 472:14,22 473:7,11 473:14 474:4,9,12 conservative 525:19 consider 607:16 considerably 450:9 consideration 515:14	considerations 648:15 considered 476:8 545:8 648:12 consistent 473:2 consolidated 509:16 constantly 540:4 constitute 538:9 construction 420:19 421:2 443:17 445:23 446:24 447:15,16,17 448:13 465:4 466:24 467:5 485:2,6,17 486:8 498:6 545:17 547:7 577:14 585:4 construction-related 534:9 construction-season 448:1 consult 408:20 502:13 consultant 542:12 597:23 consultants 442:19 595:17 consulting 534:13,21 534:24 537:8,12 539:2,18 540:20 541:15 547:16 549:20 554:18 567:12 contact 420:6 425:21 426:6 636:15 637:4 637:9 638:24 contacted 486:18 contained 449:1,14 656:11 containment 612:6 contemporaneously 505:22 content 405:18 438:17 644:6 context 411:17 446:6 contingency 602:17 continuation 629:12 continue 467:12 543:10,11,12 575:7 627:3,3 638:18 645:5,8,20 646:1 648:2 669:9 continued 629:6 continuum 475:10 contract 484:13 contracted 534:24 contractor 434:1,10 436:15 438:1 452:11 452:13,15,15,20 453:17 461:20,24 465:14,15 468:7,17
--	---	---	--	--

<p>468:19 477:2,10 contractors 401:23 431:3 434:14,15 435:5,22 436:5,19 437:4,5,6 439:6 444:16,19 462:23 464:24 465:4,7,18 465:20 466:1 468:5 468:13 476:12 480:24 487:8 538:17 548:8 595:17 596:11 contracts 596:10 597:9 614:13,16,19 646:19,22 contractual 596:9 control 396:19 397:3 397:18 398:19 421:17 422:1 466:8 508:3 533:7 556:22 557:7,22 558:23 559:14 643:20,23 conversation 627:24 649:21 651:1 conversations 661:22 conversion 470:3 convert 488:24 493:19 converted 501:9 converting 470:6 copies 395:3 537:18 Copperleaf 590:1,4 590:12 copy 440:17 527:12 537:8,12 554:18 core 573:15 621:6 Corporation 611:11 correct 400:4 401:9 401:24 402:1 403:8 403:9 406:7,21,22 407:1,2,4,11,12,15 407:16,18 409:22,23 410:1 412:19,20 415:19,20,24 416:1 417:2,5 419:24 422:24 423:22 430:8 431:3,7 435:20,22 437:2 444:14 445:11 445:18,23,24 446:2 446:3,7,20,21,24 447:1 449:12 450:9 450:10,13 453:20 458:2,18,19 463:1,6 463:11 465:1 470:8 471:3,11 472:9,14 475:19 478:6 479:8 480:12 482:7,8 484:10,11,15,22</p>	<p>486:6,24 487:1,4,9 487:10,12,13,14,15 487:17,18 488:6,9 488:14,15,17,18,20 490:21,22 491:12,14 491:24 492:8,9,13 492:14 493:10 495:6 495:12,13 496:4,14 496:15 497:10,11 498:15 499:8 500:14 500:15 502:7 503:16 513:4,5 515:23 526:13,16 528:5,9 528:12 531:19 534:4 534:10,13,22,23 539:9 541:1,16 542:4,10,17 544:11 546:22 547:13,18 549:8,23 551:5,9,10 553:2,16 560:10,11 560:14,18,20 562:14 563:12,13 564:3,4 566:22 568:5,9,10 568:14 569:7,8,14 569:15,18,23 570:15 570:16,20,23 571:9 571:15,17,18 572:3 572:6,11,14,18,21 573:2,3,6,12 575:24 576:3,13,16 577:5 578:5,6,8,9,19 579:2 579:15 580:12,18,19 580:22 581:4,5,9,10 581:13,14,21,22 582:20,21 584:7,9 584:12 587:6,7,9,10 588:2,9,12 589:5,8 589:12,15 590:2,3,9 590:17 591:10,22,23 592:6,7,15 593:2,3 593:14,17,18,21 594:2,4,7,8 595:6,8 595:12,13,18 596:2 596:3,23,24 597:4 597:21 598:6,12 600:9,13,22,23 601:4 602:14 604:10 604:11,15,20 605:8 605:17,18 606:12,14 606:18,19 607:1,4,5 607:11,15 609:17 611:12 612:5 613:14 613:16,17 614:10,11 614:14,15 616:4 620:20 631:11 643:7 643:11,14 644:1 646:20,23 650:6</p>	<p>651:22 656:10 659:22 663:11 665:22 666:2 669:10 669:21 corrected 528:10 correcting 428:6 correction 432:24 433:15 492:3 593:15 corrections 397:5,21 398:21 433:11 434:11 508:6 533:10 557:9 558:1 559:2 559:17 corrective 468:24 469:5 correctly 568:4 600:5 630:5 correspond 526:14 corresponding 531:6 538:7 corrosion 601:23 cosponsor 533:1 cosponsored 510:2 cost 423:22 424:9 498:17 515:17 517:10,15,19 518:8 518:10 519:12,20 520:1,7 535:16 536:5,22 538:12 542:1 547:13 553:9 595:3,23 597:2 610:9 612:6,16 614:7 615:13,17,20 616:13,14,20,21 617:18 640:13,14 647:16 670:11 cost-effective 670:1 cost-of-service 450:24 609:5 costs 424:8 492:7 495:11 497:23 499:4 499:4 510:20 534:4 535:16 541:12,14 542:12 543:5,11,13 545:21 547:17,21 548:17,17 549:2,4,6 549:21 550:13,14,16 551:3,4,11 552:4,6 553:15 554:7 574:8 574:11,14,16 575:1 575:4 576:1,5,17,20 577:16 591:8 595:9 595:15,15,16,16,16 595:19 596:13,14,22 597:5,8,8,16,17,18 597:21,23,24 598:3 610:18 611:22,23</p>	<p>612:14,22,24 613:2 613:3,5 614:3 615:11,15,18 616:2 616:11 617:13 618:4 618:12 619:6,11,12 619:13 620:9 646:5 646:6,7,9,11,13,15 646:21 647:4,5,6,15 647:17 670:6,7,12 670:23 671:3,5,5,6,9 counsel 527:24 count 456:17 457:24 couple 400:6 441:16 444:2,10 451:23 517:6 570:9 599:12 627:23 632:11 637:7 637:18 638:4 639:19 course 446:18 457:12 463:6 490:15 521:19 course-correct 604:5 cover 394:11 400:21 433:20 444:3 483:8 509:16 510:19 568:12 coverage 413:2 541:18 covered 400:22 478:24 510:11 530:19 537:2 covering 509:18 623:19 covers 433:22 460:20 crashes 409:24 crashing 410:3,8 crazy 647:7 create 432:23 434:24 582:7,17 584:15 created 442:17,18 531:16 582:17 creates 582:6 creating 432:16 442:21 596:5,19 633:5 credit 545:15 crew 435:17 436:4 478:9,12 479:6 480:4 489:23 492:17 498:2 499:3,11 crew's 478:24 crews 420:10,11 424:2 424:20 429:4 436:19 438:1 461:20,24 488:4 489:1,6,13 490:8 491:1,11 493:1 494:9 495:5 496:5,7,9 657:22 658:4,4 671:13</p>	<p>CRIS 478:14 571:9,13 571:16 critical 475:3,4,6,9,11 475:16,23 476:13,18 477:5 478:3 488:4 488:12 579:8 581:16 582:1 critically 582:2 cross 531:10 639:20 cross-examination 399:2,5 487:22 505:11 509:6 512:12 527:14 531:12 533:21 560:3 625:1 669:15 crossed 476:18 601:12 crossing 476:13 CRR 390:20 674:10 CSS 571:23 cumulative 607:17 current 396:5 398:5,7 409:15 419:8 426:18 429:16 443:8 456:21 466:20 503:15 507:17,19 508:16 532:20 543:13,17 556:8 558:10 579:19 579:21 609:8 currently 408:15 409:8 430:4,7 440:4 440:12 444:23 448:16 461:20 465:5 467:6 485:4 493:18 513:15 516:18 542:18 656:10 curriculum 441:1 442:7 443:15 444:12 customer 418:12 443:16 470:6 485:20 485:21 498:8 548:4 580:3,9 581:12 582:3,11,16 583:13 585:11,13,16 586:15 604:17 605:6 612:8 612:15 613:4 621:7 621:22,24 622:23,24 663:15 customer's 653:22 customer-driven 582:15 customer-facing 584:8 585:5 586:1 customers 473:10 475:5 526:5,6 580:7 580:7 582:24 583:20 584:17 586:8 596:18 596:20 599:14,21</p>
--	---	---	--	--

610:21 634:1 640:14 644:11,14,19,24 645:23 647:13 665:8 668:22 670:22 customization 645:11 customizations 645:9 customizing 645:4 Cuts 510:4 cutting 611:5 cycle 436:10,11 500:12,14 502:3 580:9 630:18 645:17 cyclical 446:23 447:15	656:8,14,20,22 657:3 659:16 database 488:17,19 488:24 490:7,13 494:11,20 databases 431:19 432:6,10,12,20 433:3 568:2 date 411:7 417:18,18 418:5,7,8 419:15 450:5 460:24 467:6 468:1,21 473:9,20 500:24 505:15,16,20 510:18 535:2 577:1 579:12,20,22 581:20 584:11 588:11 589:10 590:9 591:21 592:15 593:1,6 603:19 632:1 668:18 dates 401:14 402:22 405:17 438:12,13,16 569:24 570:1 590:16 David 506:21,24 675:9 Dawes 512:13 532:5,5 532:6,15 533:17,23 533:24 534:5,11,14 534:17,23 535:2,6,9 535:14 536:21,23 537:10,13,16,21 538:5,8,24 539:6,7 539:10,13,16 540:6 541:2,5,10,17,24 542:5,10,14,18 543:10,18 544:8,11 544:15,20 545:1,7 545:15,19,24 546:11 546:16 547:6,14,19 547:22 548:9,15,19 549:9,13,18,24 550:3,10,16,21 551:1,2,6,10,12,14 551:16,18,20,24 552:2,5,8,12,17 553:3,17,20 554:1,9 554:11,16,19 555:2 675:18,20 day 393:4 418:11 453:3,6,11 454:20 454:22 460:18,20 481:17 496:2 498:2 499:22 603:17 607:8 625:4 629:19 649:23 652:16 658:5 659:3 659:8 663:18 664:9 665:10,10 666:1	day-to-day 465:10 631:23 633:20 652:9 days 410:1,11,22 436:10,11 440:3,8 440:12 453:7,7,8 460:20 463:21 481:15 482:7 487:6 487:11 499:18 500:13,14,17 502:5 638:13,19 672:24 673:4 deal 566:17 648:23 dealt 414:24 debit 545:16 debt 519:17,21 520:7 521:7 December 457:24 460:23 481:21 482:5 483:20 484:2 526:20 570:8 579:19,23 580:1,12 581:24 584:10,24 586:16 594:1 602:12,13 657:20,23 658:2 661:8 decided 457:12,13 530:15 658:9 decides 644:4 decision 456:9 645:21 669:23 670:21 decisions 598:17 647:20 649:5 deck 486:13 606:21 decoupling 513:8,11 513:16,19 decreasing 423:11 Decter 399:6,9 401:4 402:13 403:5,9 405:12 408:3 409:7 410:17,24 411:2,5 414:12 415:6 418:6 419:1,17 427:3,6 434:20 437:13 439:1 440:17 441:22 442:14 449:22 450:20 451:8 452:1 452:9 460:22 461:6 461:11 462:11 467:14 479:19 485:14 487:19 503:16 505:9,12,17 505:22 675:6,8 deemed 554:3 defense 504:6 defer 428:1,18 489:2 489:7 493:21 495:1	deferred 513:3 516:20 516:24 524:11 525:10 526:10 530:19,20 531:2,7 deficiencies 504:16 deficiency 514:12,18 515:12,14,18 519:3 define 475:3,24 defining 470:1 565:6 definitely 532:23 definition 421:1 degree 566:22 644:15 delay 423:4 424:6 delayed 423:22 delays 422:24 424:4,8 447:21 deletions 397:6,21 398:22 508:6 533:10 557:10 558:1 559:2 559:17 deliberate 587:13 deliver 426:5 596:9,20 599:14,20 603:1 606:24 623:12 644:11 670:2,22 deliverables 614:17 delivered 614:21 615:3 652:19 delivering 596:12 639:14 delivery 560:16 605:4 621:21 demonstrate 457:18 599:7 612:1,4,11,13 department 390:3,6 393:16 396:14,22 397:11 421:4,5,7,20 434:11 448:17 449:8 449:16 450:11 500:11 502:14 503:7 504:11 505:1 507:21 510:1 511:9 523:23 546:9,21 556:17 557:1,15 559:7 631:3,10 Department's 510:3 514:23 departments 454:17 455:20 461:9 536:13 536:15,24 537:4 541:23 548:2 depend 640:3,8 dependencies 622:16 dependent 424:6 depending 497:21 513:16 653:8	deployed 594:16 deployment 430:16 430:20 depreciation 524:23 524:23 525:2 526:3 526:21 depth 483:17 derivation 515:3 539:2 derive 553:10 describe 410:3 490:23 491:15 495:14 496:16 542:11 547:20 549:16 581:6 581:11 641:21 described 578:16 582:13 639:7 describing 399:12 469:10 567:24 description 523:21 550:2 650:8 design 394:19 558:9 560:16 564:2 587:1 592:9 designated 498:12 designing 658:14 desk 431:17 452:10,15 452:19,20,24 453:2 453:10,10,17,23 637:10 638:24 669:8 detail 430:13 488:16 503:8 625:24 634:21 652:15 detailed 423:14 details 403:17 409:19 410:13 413:14 425:8 429:8 459:3,24 489:18,21 490:9 491:3 493:14,23 539:1 549:1 569:4 detect 471:9 determine 421:17 485:24 496:12 497:7 497:23 499:13,19,23 500:3 504:15 536:5 538:11 545:2 determined 553:5 determines 496:17 497:1,12 499:16 determining 535:15 540:10 develop 442:6 515:18 535:18 596:7 developed 443:15 529:19 562:16 596:11 605:2,16 648:13
--	---	--	--	--

developing 598:22 630:3 639:14,15,18	411:17,20 412:16,22 413:5,10,10,17,18 414:3,3,5,15 415:8,8 415:9 490:17 661:16 661:18,22 662:1,1 414:16	dispatched 481:10	DPU-11 620:22,23 676:14	easier 430:2 563:4 583:24 656:1
development 442:9 443:13 552:10 560:16 604:3 630:19 638:16	DigTrack's 410:5	distance 650:16 652:11	DPU-8 521:1,2 676:15	easily 429:15
device 491:17 629:20 658:15 664:9 666:8 672:8,9	diligent 482:21	distinction 634:6	DPU-9 521:23,24 676:16	effect 518:1,11
device-agnostic 658:14 663:20	dip 632:19,21 633:11	distinguishes 454:9 456:8	DPU-NG-12-1 617:8 618:5 619:1	effective 566:9 630:24 638:21
devices 491:15,19 492:17,20 493:3,5 493:16 494:3,4,8 629:4 663:9,13,13 664:23,24 665:2,17 666:3 672:14	direct 395:20,22 396:12,16,19 397:3 397:7,18 398:19 435:9 439:23 485:10 499:4 507:7,8 508:2 532:11,13 533:7 542:19 552:12 556:1 556:15,19,22 557:7 557:11,22 558:17,23 559:3,14 561:15 563:17 564:15 565:4 567:19 586:11 608:14 635:18,22,24	distributed 535:21	DPU-NG-12-2 618:5 618:15	effectively 547:4 599:23 610:13,16 624:15 628:4 640:15 667:15 670:10
diameter 475:7	directing 566:7	divided 526:20 553:9	DPU-NG-12-2-1 615:22	effectiveness 442:9
DIAZ 516:12 675:14	direction 642:11	division 390:15 393:15 468:15 469:14	DPU-NG-22-5 640:17	efficiency 409:1
Diaz's 524:11	director 507:15 508:14 509:9 532:18 532:18	do 393:6 423:24 434:13 436:3 456:20 479:7 498:5 504:22 511:14 516:22 521:17 528:22 542:6 543:10 566:6 574:11 583:18 598:19 599:10 607:12 623:16,17 627:7 631:6 632:19 633:17 633:17 637:20 642:22 647:11 651:3 651:10 653:1,4 658:11	DPU-NG-26-11 624:3	efficient 652:18
dies 633:22	disability 551:17	docket 393:5 510:1,3 512:2,7	dramatic 646:24	effort 504:4 540:19 574:11,13
differ 552:20	discovered 469:1	document 537:22 591:1 606:5 659:23	draw 433:6	efforts 455:23
difference 513:6 519:18 520:20 523:1 525:4 526:4 531:15 531:16 552:18	discovery 403:3 415:13 441:7 457:22 459:19 460:1,5,8,10 511:20,22,24 512:4 560:10	documentation 406:3 477:9 483:10,11 538:11	drill 628:12	Effron 530:2
differences 520:7,8	discrepancy 523:12	documents 403:6 405:18 425:24 449:2 620:15 646:16	drip 626:16	Effron's 529:20
different 406:18 415:16 421:10 429:19 444:5 451:12 460:21 485:2 496:23 499:3 516:23,24 517:14 518:14 519:21 520:5 521:6 523:22 537:4 542:23 586:2 594:11 598:19 612:21 613:1,3 620:12 624:11 633:12 636:23 643:9 648:20 649:13,20,21 660:17 661:13 666:16	discuss 452:24 454:7 discussed 412:16 547:3 552:18 553:19 564:9 568:15 574:19 574:21 577:23 579:11 586:13	doing 393:6 423:24 434:13 436:3 456:20 479:7 498:5 504:22 511:14 516:22 521:17 528:22 542:6 543:10 566:6 574:11 583:18 598:19 599:10 607:12 623:16,17 627:7 631:6 632:19 633:17 633:17 637:20 642:22 647:11 651:3 651:10 653:1,4 658:11	drive 412:12 653:11 666:22 670:20	eight 448:15 450:7 532:22 593:16,19 595:24 598:4 640:6
differently 627:8 666:19	discusses 581:3	dollar 527:18 670:15	driven 614:6,10 652:21	either 407:11 447:16 448:7 455:15 456:20 457:11 460:6 463:13 497:20 498:13,19 499:1,10 635:11 649:5
dig 477:4,10 479:4 490:17 572:7,9 657:7 662:4,5,6,9,11	discussing 401:7 580:17 581:3	dollars 459:8 525:22	driver 520:6	electric 509:22 511:2 511:14,14 544:14,14
digital 427:23	discussion 444:18 470:21 506:12 512:18 518:19 532:1 539:21 607:24 662:20	Dorfler 392:2	drumbeat 644:17	electronic 406:19 636:3,15
digitally 657:1	discussions 399:23 400:2 444:24 464:3 472:19 473:3 539:23	double-check 394:22 519:19,20 616:18	Dryconn 472:7,16,19 472:22 473:1,4,7,11 474:3,7,9,17	electronically 495:23
DigTrack 401:7,8,12 402:3,17 403:14,18 403:19,23 404:1 405:8 406:13,14,15 406:16,19 407:7,11 407:14 408:6,14,21 408:24 409:3,21 410:3,4,10,11,21,23	disingenuous 604:24	double-counting 543:24 552:22	duct 665:2	elects 455:6
	dispatch 581:8 582:8 621:15	download 627:13	due 399:22 423:7 424:16 482:13 562:2 562:3 563:8,9 570:7 603:15	element 529:10 617:17
		dozen 430:19	dug 477:2	elements 499:8 623:19
		DPU 390:4 393:5 476:9,11 510:1,19 510:23 511:6,11 515:3 516:10	duly 395:16 507:2 532:7 533:18 555:22	eliminate 659:20
		DPU-10 524:4,5 676:13	duplicate 673:8	eliminating 593:17
			duration 632:18,21	Elizabeth 392:3 534:1 elizabeth.a.anderso... 392:13
			E	else's 643:16
			E 391:14 393:2,2 506:21,22,24,24 518:12 521:3 532:5 532:6 533:17 576:9 675:1,9,9,18,20	emailed 527:3 529:5
			earlier 451:9 469:15 493:9 554:22 579:11 579:18 582:13 586:13 599:16,18 630:15 648:18 661:6 661:11 669:8	embedding 590:6
			earliest 594:2,6	emergencies 437:2,5 446:1 486:24
			early 590:11 626:16	emergency 486:11,12
			earnings 547:11	Emily 390:18
				employed 395:24 396:2 398:3 448:17 463:12 468:17,20 487:7 507:12 508:11 532:15 556:4 558:6
				employee 438:3 495:15,21 496:1,13 496:20 497:1,4,7

498:1,5 500:3 538:17 548:23,24 551:15,21 554:10,12 554:13 627:12 636:24 637:22 638:9 640:15 652:10,12 653:20 669:5 672:6 employee's 669:5 employees 402:3,16 402:21 404:21 405:13,16 412:18 422:19 425:19 429:14 430:11 431:3 432:22 438:6 440:5 440:6,13 448:15,16 450:2 454:5,10,20 454:21 457:10 458:7 458:9,13 461:8,13 481:9 494:24 495:16 496:5,10 497:15 503:12,14 534:8 540:4,22 541:11 551:4,8 554:3,6 580:3 582:12 583:1 583:6,21 584:4,12 584:14,16 585:24 586:7,16 589:20 593:9 595:17 627:10 628:3,8 631:24 632:5 635:2 636:15 637:3,10,14,16 638:1,2,19 639:3,4,8 639:24 640:2 648:2 656:2 657:11,18 659:4 660:21 665:9 666:22 667:3 668:5 668:5,21 669:1 671:23 enable 493:17 623:12 624:19 633:14 647:8 enablement 412:7 423:18 442:23 443:1 443:3 491:20 492:8 492:11,16,19,22 493:4,17,24 494:16 494:18 495:2 501:15 556:7,16 558:9 560:13 585:13,16 589:17 605:7,15 621:7,24 623:2 636:20 637:13,14 638:7 enablements 604:17 enabler 623:7 enables 664:17 enabling 622:11 623:10,11,18,22	enacted 483:16 encompassed 551:4 encompassing 631:22 ended 464:15 527:23 653:16 engage 436:22 engaged 436:4 engagement 563:17 581:12 599:15 622:23,24 engaging 566:2 engine 586:5,9 engineering 432:19 434:2 448:8 566:22 England 406:24 429:18 451:11,17 508:14 572:8,9 660:17,19,21,24 661:2,9 662:11 enhance 584:22 656:22 enhanced 613:13 enhanced-capabilities 613:15 enhancements 599:8 647:9,11 670:15,16 enhancing 644:12,12 656:14 657:2 ensure 434:13 482:22 649:2 ensuring 648:8 enter 496:22 entered 488:17 497:4 enterprise 586:3 617:16 621:11 622:2 enterprisewide 568:21 616:11 617:19 enters 496:1,20 entire 586:18 603:22 entirety 586:23 entities 643:19 entries 650:9 entry 495:17 592:18 650:13 658:21,21 659:1,6,11,19,24 660:1 envisioned 586:18 equipment 412:8 419:12 430:2 446:6 446:12 471:9 472:1 475:21 equipped 412:3,9 417:7 equity 518:12 errors 504:14 657:1	escapes 469:14 especially 448:13 486:19 Esq 391:3,4,14,15 392:1,2,3,4,5,19 ESRI 589:3,5,9,16 624:12,16 626:5 660:1,4,13,13,16,20 660:24 661:11 essence 560:21,23 essential 445:21 446:1 450:16 essentially 405:7 490:2,7 515:15 565:14 598:10 641:3 641:13 643:13 652:23 established 600:12 601:1 estimate 525:19 526:18 estimates 513:2,7 524:24 estimating 587:1 et 400:22 432:4 Eve 481:20 event 602:17 events 475:2 everybody 631:10 evidence 561:10,20 562:11,16 564:23 627:18 628:1 evidentiary 390:5 393:4 evolve 588:21 592:4 593:7 599:20 evolves 588:21 exact 401:14 417:15 422:5 436:17,23 440:8 473:17 481:23 505:15,16,20 530:22 exacting 464:24 exactly 400:7 442:4 504:21 519:14 545:14 554:20 561:24 579:24 601:18 616:4 645:16 EXAMINATION 395:22 507:8 512:21 532:13 556:1 615:7 EXAMINATIONS 675:3 examined 395:18 507:4 532:9 533:20 555:24 example 429:14 457:11 486:2 498:6	501:7 552:13,23 596:21 616:2 624:8 626:5 628:19,19,21 630:7 637:5 639:6 644:7 646:24 653:4 653:16 668:4 excavation 481:11,12 486:2 exceedingly 482:6,11 Excel 515:6,7,10,21 619:23 excerpted 436:8 excess 513:3 525:10 526:10 530:19,20 531:2,6 exciting 642:1 excuse 420:20 474:19 490:12 executives 539:20 exhibit 396:17,18 397:1,2 398:14,18 447:11 508:1 512:23 514:8 516:14 517:19 518:4,7 519:11 520:17 521:18,20 522:8,20 523:16,16 525:7 527:4,5,7,9 529:23 530:21 533:3 556:21,21 557:5,6 558:18,20 569:1,3 578:10,14,16 580:23 585:9,14 587:6 594:23 598:8 608:19 610:2 611:6 614:4 616:16 622:8 631:5 636:8 exhibits 395:2,3,4 507:21 508:2 520:16 533:2,6 558:22 561:10,20 676:5 exist 403:18 454:11 537:24 existed 627:22 existing 423:11,19 429:24 542:14 615:12 616:3 624:9 671:2 exists 424:21 484:23 expanded 459:7 expect 657:22 expectation 659:9 661:21 671:7,10 expectations 536:14 649:17 expected 516:19 637:4 646:4 657:24 659:4	expecting 418:10 655:23 668:3,24 expense 459:10 497:21,24 498:20,23 499:2,10,17 518:24 523:5 530:14 550:13 619:11 expensed 497:14 expenses 538:17 548:6,14,24,24 experience 486:17 528:6 540:10,12 621:22 648:10 651:10,24 652:2,3,6 652:7 experienced 445:12 652:12 experiencing 413:15 expert 413:7,7,18 493:12 534:3 610:8 expertise 405:5 488:21 540:7 explain 400:16 409:16 411:16 424:24 466:6 481:6 517:14 521:14 534:16 598:13 641:21 explained 417:7 explaining 517:10 520:12 explanation 410:10 410:21 520:20 explosion 481:17,18 exposing 626:17 exposure 567:17 express 484:19 extension 673:5 extensive 403:15 436:2 extent 403:6,19,22 426:17 486:6 489:11 603:6 611:24 612:12 637:8 647:12 654:2 655:11,14 666:18 673:7 extinguished 481:24 482:2 extra 593:8 extreme 482:16,18,23 extremely 476:6 485:15 eyes 640:20
F				
F 392:2 395:14,15 517:17 675:4				

facilitating 582:15	feet 436:21	finally 482:2 504:18	fixed-price 596:10	four 433:16 507:19
facilities 406:2 475:6	fell 487:14	finance 547:24 603:16	614:13	542:4,6 548:1
475:8 476:18 490:4	felt 663:17	617:3	flag 656:2	626:24
facility 636:13 638:8	FERC 536:24 542:2	financial 544:18	flat 610:15	four-week 541:21
fact 395:6 409:24	fewer 604:8	545:4 546:19 552:8	flexibility 604:4,12	fourth 570:14
431:10 456:23 457:2	fewer-than-30 569:5	606:24 607:3	flexible 418:3	frame 563:8 610:12
458:4 463:4 472:22	field 401:23 402:3,15	find 401:16 402:7	flip 445:14	Franklin 391:6
484:12,17 486:22	404:12 405:13,24	410:11,22 422:5,14	flowed 523:5	Fraser 390:12 393:13
492:4 500:2 501:19	406:20 407:13 408:7	432:22 452:2 470:17	flows 552:15	free 575:12
504:22 665:1,3,4	411:24 412:18	499:7 563:4 617:4	focus 567:20 612:10	frequency 410:10,22
factor 450:12 513:8	414:17 416:3,18	653:11,17,21 655:21	focused 479:4 584:13	414:16 417:5 486:24
513:12 520:8	419:10,11 420:9,10	655:23,24	FOI 462:20	frequent 417:1 501:16
factors 447:18	420:10,13,19,21	finding 549:14	folk 642:24	frequently 412:13
fail 417:5	421:2,7 426:1,3,8,12	findings 537:19 539:8	folks 407:13 423:23	467:16
failed 457:11	426:20 428:24 429:4	539:12,15	428:23 430:17,19	front 519:9,11 583:3
fails 446:6,13	429:10 430:3,7	fine 446:10 450:21	443:24 457:7 629:1	595:1 627:10 657:17
fair 417:4 448:3	435:13,17,18 436:2	459:14	663:21 664:4 667:13	660:15
488:22 536:2 539:20	438:2,4,5 441:3,13	fingers 601:12	follow 482:22 546:1	front-line 583:6 584:4
561:1 579:5 581:15	442:13 444:7 453:13	fingertips 436:24	617:24 626:18	584:12,14 585:24
584:24 641:4,14	471:9 492:12,19	fire 481:14,19,22,24	following 524:10	667:12
fairly 437:20	501:11 504:17 582:7	482:2 487:6	525:1 630:2	front-page 649:16
fall 405:4 604:13	582:18 583:6,9,13	first 395:16 399:12	follows 395:18 507:4	frost 483:7,10,12,16
falling 587:8	584:16 589:21	440:14 443:11	532:9 533:20 555:24	483:17,19,24 484:2
familiar 404:13	621:19,21 623:2,6	449:21 459:17 475:2	636:11	frustration 653:20
421:15 447:5,6,13	629:21 630:7,10	483:24 485:18,19,22	followup 503:21	665:10
447:24 469:6,23	637:3,22 638:17	503:5 504:1,7 507:2	524:9 527:13 615:9	frustrations 655:6
508:22 551:21	639:9 654:14 657:21	524:10 525:14,15	635:23	FTEs 458:22
561:12 595:5 611:17	663:1 665:20 669:5	528:23 532:7 533:18	footprint 624:11	fuel 470:7
611:19,20 661:16,17	670:19	535:15 553:5 555:22	forces 436:3 441:3,13	full 395:12 542:8
661:24 662:4	fields 656:17	556:3 567:16 570:6	442:13	545:16,19 589:14,21
familiarity 404:15	fifth 603:23	583:3 584:21 586:13	forecasted 650:2	592:1 593:4 594:5
453:9	figure 418:21 454:15	593:24 599:14 601:6	forecasting 647:15	594:11 613:3
familiarize 627:14	651:15,19	601:14 602:7 621:10	foregoing 674:4	full-time 454:5
far 393:22 412:13	figures 650:21	624:7 627:1 628:2,5	foreign 476:15,17,19	fullest 484:15,22
434:24 443:22	file 395:5 426:14	636:17 637:9,12,18	477:7	486:5
583:24 602:19	524:17 563:1,3	638:19 650:4,7	forgetting 671:15	fullest-extent-practi...
603:13,20,21 605:5	606:2	661:9	form 490:20	485:4
609:11 642:14 656:1	filed 395:1 508:23	fiscal 544:4 570:2,4,5	forma 538:12	fully 584:18 585:7
Farmer 390:22	509:24 511:23 562:2	570:9 579:13 588:11	formal 626:17	586:17,17 588:13,23
fashion 447:23	562:5	589:10,14 592:6	formally 658:7,9	592:5 594:15 668:12
faster 493:6 633:8	filing 509:15 510:12	593:2 600:15 604:9	format 489:1 515:21	function 446:19 455:9
faulty 424:16	510:19 511:10,16,20	604:18 605:7 606:17	formula 514:24	578:17 581:6,11
features 645:22 648:3	512:5 513:4,7,9,21	617:10,12 618:4	515:11,21 519:6,9	582:11,22 584:3
669:20,24 670:4,10	514:14 523:3 608:7	619:1 620:13,19	521:14	586:19
671:4	610:6,23	fit 536:13 639:21	formulaic 516:4	functional 509:15
February 617:11	fill 399:23 455:6,24	fitting 469:2	formulas 538:10	548:3 585:7 586:18
Federal 509:16	659:4	fittings 468:12	forth 449:1 654:19	588:24 592:5
524:17,20	filled 456:5 457:4	five 409:24 422:19	forum 408:3	functionalities 594:17
fee 610:15	458:16 540:22	453:7 603:3 604:7	forward 400:11,13	594:19 645:22
feed 475:5,6	filling 399:22 400:9	604:14 610:17	473:6 534:19 561:7	functionality 495:3
feedback 599:8 629:6	400:13 535:23	621:22 624:11	575:8 652:16	587:12 588:21
629:11 668:20	final 508:21 524:16	672:24 673:4	found 477:1 638:20	589:14 590:6 592:1
feel 566:16 575:12	525:3 535:10 577:12	five-day 563:8	foundational 579:9	593:5,24 594:5,12
629:5 630:1 637:23	586:23 619:20	fixed 544:6 614:24	608:3	599:9,23 600:1
feels 590:11 604:6	623:13	646:21	Foundations 563:16	632:7 645:5 647:7
fees 548:7,11 615:1	finalized 441:4,14,15	fixed-cost 646:19	563:18	functioning 601:5
646:10	441:16 442:1 444:13			

functions 408:15 442:5 456:21,22,23 496:12 579:8,24 580:11 582:19 585:23 602:9 605:7 648:4 669:20 670:1 670:5,10 671:4 fundamentally 642:24 further 505:11 506:4 526:24 527:14 528:18 531:12,22 620:9 624:21 632:4 657:9 669:12,15 672:15,17 future 429:5 543:9 582:20 644:8 645:6 645:6,19 646:13 647:15 FY 585:12 586:24 587:8 589:1 594:22 603:5,9	616:7,8,8 619:22,22 636:19 637:13,14 638:7 650:3,4,8 gather 598:23 GB 409:12,17 GBD-5 585:9 GBE 419:5 424:23 425:3,7,10 427:13 427:14,18 428:1,5 428:12,12,19,21 429:7,14,22 430:1 430:18,21,24 431:2 434:22 435:3 439:24 443:11 493:13,22 555:14 560:7,9,16 560:22,24 561:11 563:23 565:3,11,20 566:11 567:24 568:11 569:7,14,21 570:18 571:1,3,17 572:5,10,20 573:5 573:11,20,23 574:9 574:17,18,22 575:5 575:6,23 576:3,5,15 576:18,20 577:8,11 577:18,24 578:5 579:8 581:16 586:19 588:1,8 590:2,7,22 591:4,9,17,19 592:2 592:6,12,22 593:5 593:13,20 596:2,5 598:11 605:12 606:23 608:5 610:20 611:18 612:17 614:13 615:11,15 616:10 624:9 625:20 626:14 628:16 631:22 634:19 635:22 637:2 638:1 639:3,24 641:1,10 641:17 642:22 649:14 650:3 654:2 654:3,10,13,23 655:9,20 656:9 657:15,17 659:20 661:20,23 662:7 663:10,15 666:4,24 667:2,2 669:19 670:5 671:5 GBE's 646:5 GBE-program-wide 616:6 geeky 642:3 general 392:6,16 393:7,9 397:11 404:2,15 406:17,18 411:19 421:11	428:22,22 453:9 455:12 471:19 486:18 503:3,22 534:3,18,20 537:1 543:3 547:23 557:15 559:7 560:2,6 642:16 669:14 General's 528:22 529:1 615:10 generally 424:18 432:21 444:7 448:5 466:3 475:7,11 483:5 486:20 490:23 508:22 generated 480:21 generically 515:2 geographic 443:6 444:3,5 geospatial 490:3 getting 589:19 596:4 600:5 601:9 633:5 633:19 637:11 652:14,21 660:22 GIS 406:24 429:18 431:19 432:6,10,20 433:3 451:11,17 489:10 490:1 492:12 505:6 621:16 623:1 624:12 655:9 660:17 660:19,22,24 661:2 661:6,9 GIS-NE 660:2,7,10 give 420:23 422:2,15 427:15 456:12 461:3 514:19 568:22 599:9 617:15 628:18 629:5 653:3,15 667:8 given 412:18,22 419:1 460:18,20 498:2 499:3,11 629:4 666:4 gives 515:22 630:23 giving 406:4 590:15 651:17 663:20 go 393:3 416:3 425:15 426:12,20 429:13 440:2 441:18 450:22 451:3,5 459:18 461:12 470:19,22 483:6 503:1 506:10 506:13 512:17,19 518:17,17,20 519:24 521:10 522:18 525:8 528:4 531:23 532:2 553:4 555:16 570:7 582:9,18 585:21 599:18 602:10,11,23	603:12,15 604:6,7 607:22 608:1 609:12 613:19,21 617:2 622:10 626:21 627:1 628:10 629:16,21 633:24 635:13 637:12,19 638:17,20 639:2 643:9 645:8 652:18,19 653:22 657:7 658:5,12 662:18,21 664:14 665:19 671:5,5,9 672:21 673:13 go-live 628:2 629:15 635:4,12 638:14 goes 410:10,11,21,23 414:15 496:2 602:19 603:23 614:22 642:8 going 404:5 405:20,23 408:10 409:12,14 411:11 412:7 413:11 416:22 417:22,24 418:4,5 420:16 422:5 423:17 424:24 425:6 427:8,16 428:5,12,13 431:2 434:16 437:23 439:2 439:20 440:19 442:10 448:22 449:20 451:24 452:4 454:4 458:1 459:2 461:2,14 467:7 468:8 473:5,24 474:21 477:23 479:22 484:4 489:2 493:10,11,13 501:15 503:3,17 506:1 510:14,20 512:1 517:6 521:22 524:3 526:24 528:7,8 534:19 538:2 545:5 546:23 555:4 556:3 563:1 571:4 579:12 580:2,5 581:23 582:7,19 583:11,12 583:15 584:3 588:13 588:14 589:6 590:6 590:10,14 592:3 593:5 594:1 601:6 601:13 603:3,5,17 604:5,23 607:9 608:14,21 619:17 620:21 622:11 625:5 628:14,15 629:13 630:18 632:13 634:3 635:18 637:3 638:21 641:9,19 644:10	647:6,8,15,19 648:9 648:23 649:1,11,19 652:11,15,15,17 653:15 654:8,23 655:8,18,19 656:1,4 657:7 658:10 660:5 660:6,7 661:3,4,5,7 662:6,7 663:10,19 663:20 664:15 665:24 666:12,17,23 667:5,17,18,21 668:4,9,16 669:9,23 670:5,6,9,21 671:17 673:2 good 399:7,8,9 450:19 487:24 488:1,2 500:6 501:14 509:8 533:23,24 560:5 562:9 563:22 589:22 602:1,5 613:4 625:3 627:2 647:16 663:22 663:24 Google 418:20,21 653:13,17 goose 418:17 governance 565:7 GPS 653:6,8,8 graduated 567:2,6,13 graphical 592:8 great 394:16,20 414:16 417:5 451:2 468:6 504:3 562:6 589:22 656:21 666:11 greater 599:15 Grid 390:10 391:12 391:16,23 393:7 396:2 398:5 418:13 431:16 442:18 463:13,17 468:18,20 472:2 473:13 474:5 505:13 507:14 508:13 509:24 511:10,23 524:12 532:17 534:6 539:19 540:20,21 541:1,4 541:12 542:19 543:7 544:12,15 547:4 549:20 556:6 558:7 563:11,14 567:8,12 567:17 583:14,21 590:24 597:21,23 616:20 627:12,21 644:2,9 645:14 Grid's 437:10 452:18 474:9 541:2 542:14 610:19 612:1 624:10
--	---	---	--	---

597:16 613:16 671:1 includes 436:1 462:19 468:3 548:16 551:11 551:15 553:1 597:20 620:19 including 412:8 427:20 459:7 478:24 488:13 544:13 585:3 585:3 627:20 income 507:15 509:9 513:3 524:18,20 526:7 530:14 546:7 incorporate 511:9 512:2 incorporated 608:13 617:6 incorporates 511:14 incorrect 486:7 increase 424:8 463:24 464:18 483:4 633:14 639:23 increased 450:6,9 482:17,20 increases 393:9 423:22 448:2 464:1 increasing 464:4 incredibly 540:9 incremental 456:16 456:19 519:2 599:11 612:1,4 670:12 incumbents 440:5 independent 540:4 623:15 independently 590:13 indicate 472:17 473:7 501:12 516:17 539:7 540:24 547:15 619:18 indicated 435:8 477:4 493:9 500:11 553:1 598:9 indicates 448:14 462:21 indicating 621:8 indications 501:5 individual 400:15 403:17 413:23 414:1 415:4 416:3 424:6,7 480:8 490:8,10 499:9 546:4 598:4 627:21 651:17 individually 543:1 individuals 408:7 415:22 454:10 458:24 535:19 626:24	Inevitably 667:24 infer 626:8 influence 644:16 inform 432:23 informal 539:18 Informatica 656:16 information 397:10 397:15 402:7,10,11 404:23 405:4 407:14 408:7 410:16 411:9 415:22 416:8 418:4 418:17,20 419:10 420:2,4,8,23 421:22 422:1,6 426:14 428:20,21,23 429:2 429:3 432:5 433:5 435:18 438:21 445:22 448:19,23 449:14,15 452:3 458:5 459:5,12,15 460:21 462:4,5 463:20 467:8 468:3 473:20 488:3,4,8,9 488:10,13 489:5,11 489:13,17,22,23 490:3,8,19 491:11 492:21,24 493:19 494:2,9,20 503:9 504:19,24 505:2,3,5 508:23 509:18 539:4 546:15 557:14,19 559:6,11 617:8 619:4 624:2 631:15 641:2 653:6 655:12 655:13,15 656:10,11 664:11 665:18,21 666:22 673:9,9,10 information-request 397:22 558:2 559:18 informed 492:2 infrastructure 431:18 431:24 432:13 649:1 649:3 initial 457:2 511:19 512:3 523:3,6 608:6 610:6,23 initially 660:10 initiated 404:12 423:3 469:20 initiatives 412:6 input 630:23 644:2 inputs 519:3 521:11 521:16 inputted 516:1 insignificant 513:18 inspected 463:19	inspecting 464:9 inspection 463:10 464:13 467:20 489:20 inspections 463:5 465:22,23 466:2,4,8 466:11 469:16,17,18 inspector 476:15,17 476:20,23 477:7 inspectors 462:17,18 462:19,20,20,22 463:4,19,24 464:9 464:12,19 465:8,21 466:17,19 installation 436:13 437:7 463:9 470:6 472:22 501:8 installations 461:22 installed 590:5 instances 424:3 426:23 instituted 504:21 instructed 420:6 426:5 instructions 472:12 472:13 473:1,5,6,10 535:19,22 instructors 444:23 instrumentation 628:23 insufficient 542:13 insurance 551:15 554:10 integral 606:8 integrate 616:3 integrated 573:15,20 574:22 577:11 integrating 615:12 624:9 integration 574:3,9,10 574:20 575:2 576:2 576:18 577:16 590:14 591:5,8 602:21 641:22,23 642:14,16,17,20,24 integrations 641:19 642:4 643:8 integrity 591:14,16,24 intend 627:3 638:18 intended 395:6 578:7 580:20 635:7 intending 639:5 intends 408:23 409:3 409:4 intent 484:14,19 intention 400:8	interacting 566:4 interactions 585:11 interested 408:22 428:17 455:21 525:12 666:7 interface 642:8,10 interfaces 615:19 interfacing 669:7 interlinked 582:2 660:18 internal 496:7,9 537:19 539:17 597:20 internally 603:3 606:1 interrupt 534:15 intervenor 397:12 557:16 559:8 intuitive 627:17 invested 610:19 investigate 485:23 investigation 477:13 477:14,20 478:23 481:10 510:4 investigations 477:15 investment 396:3 606:11 610:11 616:6 616:7,14,19 618:20 622:5 624:18 651:6 investments 619:15 622:4 involved 396:9 398:10 508:19 556:11 558:13 638:15 639:7 639:10,13,17 involves 584:12 iOS 670:17 iPad 627:23 657:17,19 iPads 412:9 430:3,6 430:11 657:11 658:5 658:8 663:21 iPhone 407:1,3,6 412:17 670:17 iPhones 406:21 407:9 412:9,23 414:14,17 663:21 Irani-Famili 555:19 555:20,21 558:5,7 558:12,15,21,24 559:5,9,12,15,21 563:22,24 564:4,7 564:14,21,24 565:9 565:12,16,21,23 566:13,19,23 567:1 567:4,7,10,14,16 594:9,22 601:20 625:4 626:3 628:17 630:9,14 631:4,12	632:3,11 634:10,20 634:22 635:6,9 638:4 639:12 640:3 644:19 647:18 648:5 648:19 649:12 651:24 652:7 653:3 654:20 656:5 658:18 664:21 675:22 iron 481:11 IRS 528:10 IRS's 525:24 ISE 623:10 Island 561:7,16 562:5 564:16,20 585:17,19 600:16,21,22 601:2 601:5,14,21,21 602:4,10 603:15 626:22 628:2,21 632:24 635:10 656:20,22 658:9 isolate 458:20 596:22 597:1,5,7 issue 423:16 425:22 511:15 517:4 637:1 664:22 666:6 669:18 673:2 issued 430:11 479:15 480:4 536:18,20 673:7 issues 399:23 411:22 412:22 413:10,16 414:2,8,10,13,20,21 414:23 415:5,18 416:6 420:8 423:8 423:15 424:10,17,19 425:15,16 431:19 432:1,9,11,16,22 445:4,6 448:12 453:4 472:21 529:2 633:12,21 637:19 638:24 654:8 664:24 665:6 667:19 item 619:5 638:5 itemize 569:4 itemized 598:4 items 483:24 662:23 iterative 536:15
J				
J 392:5 522:2,6 January 401:8,20 411:5 413:11 482:2 482:5 483:20 484:3 510:15,20 Jeanne 394:3 Jeff 390:17 393:14				

<p>Jesus 480:22 job 414:22 424:4 442:20 446:19 455:1 458:23 459:1 460:15 461:3 465:9,9 476:24 477:3,3,8 480:10 489:18,22 499:5 501:8,11 582:7 600:2 628:14 631:12 635:11 637:20 653:1 jobs 419:22 424:7 436:22 467:19 480:9 510:5 651:16,17 652:19,22 jobsite 479:8 Joe 478:14 Johnny 443:3 629:3 633:17 638:23 JOHNSON 555:21 675:22 Johnston 443:3,4,5 555:18,18 556:3,4,6 556:10,13,18,23 557:3,8,13,17,20,23 558:4 560:8,11,14 560:18,20,23 561:4 561:13,17,23 562:14 562:18 563:10,13,17 563:21 564:10 566:17 567:18,22 568:5,10,14,19,21 569:2,8,11,15,18,23 570:3,6,13,16,20,23 571:2,10,12,15,18 571:20,24 572:3,6,8 572:11,14,18,21,24 573:3,6,9,12,22 574:2,6,10,15,18,23 575:3,6,11,17,19,21 575:24 576:4,7,10 576:13,16,19,24 577:3,6,9,12,17,20 578:1,3,6,9,12,15,20 578:23 579:4,9,15 579:17,21 580:2,13 580:16,19,22 581:1 581:5,10,14,18,22 582:1,14,21 583:2 584:5,7,9,13,20 585:1,8 586:3,21 587:7,10,19,22 588:6,9,12,17 589:1 589:4,8,12,15 590:3 590:10,17,20,23 591:5,10,12,15,18 591:23 592:3,7,10</p>	<p>592:13,16,20,23 593:3,7,14,18,21,23 594:3,8 595:2,6,8,13 595:18,22 596:3,24 597:4,7,22 598:6,12 598:16 600:9,13,18 600:23 601:4,7,15 601:18 602:11,14,20 603:14,21,24 604:11 604:15,21 605:9,14 605:18 606:3,4,8,12 606:15,19,22 607:2 607:5 608:10 609:18 609:23 610:7 611:1 611:8,13,16,19,24 612:5,8,19 613:10 613:14,17,24 614:11 614:15,18 615:14,19 615:23 616:1,4,10 616:15,18 617:1,9 617:14,23 618:8,13 618:17,23 619:14,17 619:24 620:5,20 621:2,4,9 622:10 623:22 624:4,10 625:3,22 626:1 627:6 631:17 635:3 635:19 636:5,19 637:7 640:18,24 641:5,7,15,17,20,23 643:4,7,12,15,18,22 644:1,5 645:2,18 646:6,20,23 647:4 650:6,11,19,22 651:22 652:6,14,24 654:11,16 655:2 656:7,13 657:13 658:3,23 659:1,12 659:14,22 660:5,8 660:11,18 661:1,3,5 661:10,12,15,17,21 662:2,5,9,15 663:3,8 663:11,14 664:20 665:13,15,22 666:2 666:7 667:1,24 668:8 669:10,17,22 670:2,8 671:1,7,11 671:17,20,24 672:8 joined 622:15 joint 611:10 Joseph 392:1,2 joseph.dorfler@sta... 392:12 joseph.rogers@stat... 392:11 journey 584:21 633:19 634:3</p>	<p>jurisdiction 467:1 507:16 509:10 jurisdictions 487:3 509:13,17,20 544:16 564:18 587:2 627:5 629:9 663:16</p> <hr/> <p style="text-align: center;">K</p> <hr/> <p>Keeffe 391:15 Keegan 391:5 keen 612:11 keep 416:2 421:12 426:10,24 427:1 433:1 441:21 601:12 602:7 618:10 623:18 625:5 668:17 keeping 622:15 669:3 keeps 416:19 426:17 433:10 455:22 kept 455:4 Kevin 392:19 625:6 key 612:9,20 647:9 664:17 KeySpan 463:18 Kimball 391:3 393:23 394:1,16,20 403:2 417:22 418:15 427:2 451:2 452:4,22 453:20 460:18 461:1 503:13 506:8 511:13 511:18 512:14 514:6 527:6 528:20 529:5 529:9,13,15 531:8 555:11 562:1,9 563:3 605:24 608:11 608:18,21 609:4,10 616:23 625:8,11 672:4,20 673:3,12 kind 418:20 521:4 528:7 621:12 626:18 635:7 640:11 663:12 kinds 418:16 638:2 639:4 Kirylo 667:4 Kirylo's 447:10 kmerritt@segalro.it... 392:23 know 394:15 400:23 401:14 402:14,18 403:18 405:2,12 407:8 408:17,19 410:2,6,7 412:11 413:7,22 414:22,23 416:9 417:11,15 419:4,11 420:7 421:24 423:13,16</p>	<p>425:22 426:13 428:19 429:22 433:4 435:1 438:6,11 439:24 443:10 445:7 449:24 451:13 452:12,21 455:18 459:19 460:5,14 461:2 463:20 464:15 469:13 472:18 474:14 478:23 479:3 486:14 489:4 491:4 493:11 502:9 513:15 517:18 520:16 523:2 525:3,17 528:14 529:4 535:2 545:20 562:15 566:13 571:7 577:1,3 585:6 602:6 602:8 608:6 609:2 609:18,22 610:8,22 611:21 617:12 618:8 619:10 628:9 631:16 634:13,13 635:5 645:16 652:4 656:18 657:4,7 661:19 662:6 663:23 666:9 671:13 673:1 knowledge 402:4 404:24 433:17 448:4 449:11 463:22 492:15,18 known 646:11 knows 403:1 608:24</p> <hr/> <p style="text-align: center;">L</p> <hr/> <p>label 403:7 600:16 labeled 403:8 569:10 600:6,19 labels 600:20 labor 423:22 424:5,10 486:13,19 538:16 543:18 552:14 574:13,16 575:1,4 576:1,17 577:16 591:8 597:21,23 615:11,13,17 lack 653:9 lag 501:3,18 laid 458:11 566:1 landing 566:6 language 484:23 485:4 lapse 416:10 laptop 630:8 laptops 633:21 663:1 large 397:16 418:12 431:17 437:20 475:5</p>	<p>546:5 579:7 602:20 larger 475:7 late 571:7 575:13 607:8 625:4 law 530:10 Laws 393:7 lay 458:5 642:24 layer 642:16,17 643:9 lead 424:19 482:20 509:17 518:23 520:4 520:9,19 523:17 leaders 435:17 436:4 636:22 leadership 622:19 leads 419:9 leak 481:10,13 485:17 485:19,20,23 486:1 489:19 498:21,22,22 498:23 653:4,5 leaks 482:17,20 483:2 580:6 learn 587:13 632:6 learned 601:8 learning 629:13 658:12 Leary 394:8,11 leave 439:24 454:20 457:13 530:16 led 481:14 539:16 left 455:5 501:11 legacy 425:2 428:15 428:20 451:16 460:3 460:15 491:19 569:20 570:17 591:7 642:6 655:12 legal 527:24 547:24 lend 536:9 length 416:8 lessons 587:13 601:8 let's 393:3 427:15 429:13 437:13 440:2 451:3,5,21 461:12 470:19,22 502:22 503:1 506:10,13 512:17,19 518:17,20 527:7 531:22 532:2 555:13,16 601:11 604:17 607:22 608:1 613:21 628:13 662:18,21 673:13 Letter 522:2 letting 529:4 level 450:14 503:8 549:22 626:10 633:1 633:4,24 634:15 levels 449:1 503:6 632:22</p>
---	---	--	---	---

leveraging 591:1	located 443:4,5	lost 423:7 424:16,20	makeup 634:24 635:6	maps 406:9,12 409:14
LI 585:19	locating 420:11,11	lot 422:13 461:9 536:4	making 419:2 456:2	426:12,20 427:24
liability 530:15	446:6 471:7 636:4	536:11 549:3 565:23	486:15 504:3 607:14	428:6 429:6 446:16
license 597:17 646:10	location 409:1,6 426:3	575:14 586:6,10	628:8 633:18 634:5	488:13,16 493:20
670:11	426:15 443:9 471:18	589:18 604:4 607:9	647:6 670:15	500:11,16,24 501:5
licensing 670:23	471:21 481:12	607:12 626:4 627:16	manage 621:18	501:16 502:12
671:2	489:22 490:4 505:5	628:11 633:10 648:6	622:14,16 645:10	504:24 589:21
life 525:18,21 526:15	locations 409:13	648:6 651:1,2	646:11	621:17 653:13,17,23
526:22 531:17	426:20 427:21	lots 627:19	management 444:23	664:11
551:15 554:10	488:14 490:14	loud 467:13 625:14	465:19 490:18	march 524:18 545:10
limb 528:7	654:15,22,23 655:1	louder 401:5	492:12 495:17 565:7	545:14 546:3 547:2
limited 430:15,19	locator 628:14	love 657:18	565:11,15,17,20	553:14 575:8
462:18 531:11	locators 406:1	low-pressure 468:12	578:18,20,23 579:1	mark 527:7
647:24 649:19	log 629:17 637:10	469:2	581:7 586:4 588:5	marked 395:5 396:17
line 414:7 437:23	logging 630:8	LTE 664:20	588:17,24 591:2,14	397:1 398:14 508:1
501:9,9 502:1,1	long 396:5 398:7	Luksha 390:18 615:8	591:16,24 595:11	525:7 527:4,9
516:15 518:11 522:9	400:5 416:2 417:13	624:21 676:1	621:6,7,11,12,13,15	529:23 533:2 556:20
540:15 602:24 619:5	481:22 501:24	lunch 452:5 457:21	621:17,21 622:3,5,6	557:5 558:17,19
624:7 625:17 627:10	507:17 508:16	502:19,22,24	622:19,21,22 623:1	605:20 606:1,5
631:8 636:1,12	524:13 532:20 556:8		623:2,3,5,9 625:18	676:5
638:5,6 646:18	558:10 585:19		632:17 655:4	market 596:8
654:5,12 657:10	600:22 627:11 645:3		manager 421:20	markings 501:23
662:11	645:6 655:5 657:24		466:16	markout 446:14
lines 504:6 549:11	long-term 551:17	M	manages 483:3	628:13,18
567:20 614:5 631:19	longer 412:4 418:9	M 390:12 391:3	managing 566:9	markouts 406:2
linked 655:5,9	419:9 436:22 642:10	MA 585:16,17	622:3 648:7	marks 501:11
list 395:4 457:4	look 431:12 449:4	main 433:15 434:23	mandatory 402:19,19	Mass 511:2
489:14 490:6 527:12	459:14 462:13 469:7	435:5 436:9,21,22	402:20 405:14,15,16	Massachusetts 390:2
554:22 621:3	478:8,20 500:8	436:23 437:6,7,9	641:12	390:7,23 391:7,18
listed 462:17 622:8	515:7 564:14 567:19	448:2 459:8 461:21	map 409:12 427:21	392:9,21 402:16
listening 667:3,4	569:9 571:19 575:8	461:24 464:1 465:9	428:22 434:12 441:2	404:21 416:18
lists 606:13 607:3	578:10 588:4 594:23	465:15 466:23 467:5	441:12,19 442:6,11	420:14 422:17
literally 471:10	598:7 599:17 600:14	471:2 475:3,4,15,16	442:12,17,19,21	433:20,22 435:13,16
641:18 653:1 660:15	604:17 605:11	475:23 476:13 477:5	443:11,14 444:9	436:12 437:10
little 566:20 574:5	618:10 645:14 649:2	478:3 479:2 480:6	501:8 583:7 585:9	439:19 443:13,19
625:9 628:12 629:5	649:14,14 650:24	481:12 500:12 501:7	588:22 589:1 598:10	444:5 454:17 460:16
632:4 642:2 646:17	652:12,15 660:12	501:7,24 583:3	602:15 603:15	466:21 467:1 469:21
657:9 659:2 669:18	662:17 667:8 668:10	612:15 621:24	604:10 644:8,12,23	470:13,15 472:6
live 464:14 528:24	looked 515:6 548:10	main's 478:16	653:10 654:14,21,23	476:11 495:22
601:24 602:10,12	610:12 669:3	666:23 668:6,8	654:24 655:10,23	507:16 509:9,22
603:16,17 628:10	looking 400:19,20	mains 429:10 436:12	656:1 657:14	544:14 546:10
637:12 638:20 658:5	404:7 419:15 434:18	436:14,20,20 439:9	mapping 404:12,16	564:17,23 569:17
lives 531:2	437:16 440:21 450:2	439:18 445:17	407:3,6 409:15	579:12 580:3 581:20
LLC 390:22	468:5 478:24 505:19	446:11 468:13 475:9	428:16,22 431:7	582:23 584:11
Lloyd 394:3,9	522:2,22 523:16	475:11 525:21 636:4	432:19 434:1,11	585:18 588:10
LLP 391:5 392:18	540:13 565:24 566:2	maintain 484:20	445:11,13,17 446:10	589:10 590:9 591:21
load 406:3	588:2 610:10,14	494:9 495:10	446:18 447:4,14	592:15 593:1 594:3
local 392:24 394:8	611:13 612:14	maintained 488:20	448:8,11,15,16,17	600:21 601:3,17
395:1 399:17 400:10	613:11 618:6 620:1	maintaining 494:19	449:8 450:3,11,13	602:10 604:19
447:3 484:13,19	645:11 649:10 651:6	maintains 454:24	450:15 490:2 501:15	610:20 616:21
486:22 625:7 637:15	653:19 659:2 669:1	maintenance 443:17	502:14 503:6,12,14	617:22,24 624:13
637:15 656:22	looks 483:1 568:6	445:22 485:2,6,18	503:22,23 504:2,7	626:7 629:9 646:12
locals 445:1	629:14 649:20	485:24 486:3,4	504:11,12,14,19,23	657:20,23 658:4
locate 419:23 446:7	looser 642:14	497:9 498:6 523:5	505:23 589:16,18,20	661:7 663:16 671:13
446:12,13 471:24	lose 424:2 631:13	major 450:12 649:4	624:12 626:6 655:3	671:23 672:7
472:3,4 636:13	loss 423:4 424:22	437:5,6 566:13	655:10 657:5	Massachusetts-only
637:5 638:8		586:7 668:12		618:1

Massachusetts-spec... 568:23	489:2,7 495:9,16,22 496:4,6,9,15,19 497:3,11,15 498:4 500:18,22 635:21 654:1 675:4	meters 580:6 method 434:22 526:4 543:11 598:20,21,21 598:22	module 516:20 524:11 597:8,16	540:20,21 541:1,2,4 541:12 542:14,19 543:7 544:12,15 547:4 549:20 556:6 558:7 563:11,14 567:8,12,17 583:14 583:21 590:24 597:21,23 610:19 612:1 616:20 624:10 627:12,20 644:2,9 645:14
master's 566:21	mean 411:16 421:1 495:7 511:19 514:21 542:15 543:17 550:10 574:13 585:2 600:10 604:16 610:16 632:8 642:19 662:13	methodology 541:16 599:3,12 methods 407:9 429:5 636:14,17 638:8	Mohawk 611:11 612:22 613:2 moment 450:2 507:11 607:21 611:4 662:17 671:21	natural 470:7 nature 473:17 NE 572:7 near-miss 478:10,11 nearing 480:19 necessarily 464:13 483:18 604:16,19 necessary 406:1,6 435:18 492:21 549:3
material 606:24 633:18 635:1	means 486:14 491:6 598:14 625:24 641:11 642:17 649:6 664:7	metrics 442:9 microphone 401:5 microservices 642:5 642:13	Monday 394:2 514:6 money 424:16 550:5 month 545:10,14 months 441:17 450:7 508:18 524:16 525:1 532:22 634:15	NE 572:7 near-miss 478:10,11 nearing 480:19 necessarily 464:13 483:18 604:16,19 necessary 406:1,6 435:18 492:21 549:3
materiality 528:2	meant 455:19	Microsoft 619:23	morning 393:12 399:7 399:8 487:24 488:1 589:18 623:8 635:20 644:21 655:6 659:3 661:22 662:24 665:19 673:1,8	need 394:4,13 403:7 403:16 406:17 407:5 407:19 408:2 412:1 416:6 419:6 420:3 420:24 422:20 425:20,24 435:24 438:6,8 446:8 447:19 448:20 449:2 449:11 452:4,5 459:18 460:12 481:1 489:24 502:13 505:17 517:12 527:19 532:23 561:23 596:18 599:19,19,24 602:23 611:1 616:18,21 617:2,18,24 626:9 635:16 640:5,7,11 640:14 648:11 653:7 659:16 664:7,12 665:1,7 667:21 668:1,4 671:14 672:12,14 673:4
materials 440:18 548:22	measure 502:11	mid-1990s 660:14 661:10	morning's 662:2	needed 420:9 447:4 485:24 486:1 487:8 536:5 603:6
matter 393:17 394:23	measures 414:4 415:8 436:9 439:7,12,15 501:2,18,19 502:15	mileage 650:12	motion 395:1 673:5	needs 450:16 630:24 648:12,13 672:9
matters 395:10	mechanism 429:20 513:16	miles 436:9,10 500:12 500:13 652:21 653:2	move 400:13 451:21 577:13 583:22 593:8 593:9 603:6,9 624:19 627:4 642:20 657:3 661:22	negotiating 464:6
maximize 409:1	mechanisms 510:9	milestone-based 614:20	moved 603:18 656:12 656:23	net 526:19
Maximo 489:16 570:7 578:4,7 579:24 581:3 582:2,6 585:21,22 586:3,12 586:17,23 588:15 589:6,13 596:16,23 597:6,12 667:14	Medium 475:14	Millbury 443:20	moving 400:10 409:11 474:24 585:1 643:4	network 413:3 417:18 418:9,14 419:9,16
Maximo's 578:17	meet 419:7 602:17 604:13 644:13	million 530:6 553:8 553:10,20 554:21 606:14 607:4 609:19 610:21 611:23 613:13,16 616:17 617:16,20	multiple 444:3 459:19 459:20 481:15 498:9 596:15 628:7 640:19	never 637:23 new 404:12 406:24 408:3 412:15 424:24 428:21 429:18 439:9
MBA 566:24	memory 422:9 433:9 436:7	mind 568:24 578:10	N	
McNAMARA 395:14 395:14,15 398:3,5,9 398:12,16,20,24 399:7,8,11,16,19,21 400:4,6,12,18 408:12 420:22,24 421:5,9,15,20 428:7 430:14,15,23 431:4 431:8 440:8,22 441:5,8,16 442:2,5 442:18,22 443:2,5,8 443:12,19,23 444:2 444:8,14,17,22 445:20,24 446:3,8 446:15,21,23 447:6 448:3 453:19 455:3 455:7 461:18 462:2 462:4 464:8,11,16 464:21 465:5,11,17 466:3,7,12,15,20 467:2,17 468:2,14 468:19,23 469:4,13 469:18,22 471:4,12 471:19 472:3,10 475:4,11,14,17,20 475:24 476:3,5,10 476:16 478:5,12,17 478:22 479:3,9 480:11 481:4,9,18 481:20,23 482:4,8 482:12,18 483:1,11 483:14,22 484:11,16 484:23 485:19 486:7 486:10,14,17 487:1 487:5,10,13,15,18 488:1,7,10,15,18,21	mention 400:17 444:8 454:3 490:16 654:13 657:10	minute 422:2 470:20 521:9	N 393:2 675:1	
	mentioned 403:20 460:19 537:15 579:18 604:8 614:12 632:12 633:17 635:19,21 638:1,5 643:8 646:19 654:3	minutes 627:24 665:3	name 393:11 395:12 452:12 479:18 506:16,20 532:3 555:17 560:5 625:6	
	merger 530:3,17	missed 662:17	named 480:22 534:13	
	merging 463:18	missing 656:16	names 395:5 451:14 661:13	
	Merritt 392:19 394:24 625:2,6,10 625:13 636:9 662:16 669:11 676:2	mistake 630:11	Nantucket 544:14	
	met 399:10	misunderstanding 472:20	narrative 408:8	
	metal 471:10	mix 459:6 595:15	National 390:10 391:12,16,23 393:7 396:2 398:5 418:13 431:16 437:10 442:18 452:18 463:13,17 468:18,20 472:2 473:13 474:5 474:8 505:13 507:14 508:13 509:24 511:10,23 524:12 532:17 534:6 539:19	
	meter 580:3,10 582:12 586:15 663:15	mobility 581:8 583:5 621:20 655:4		
	metering 443:16 485:21,22	model 514:19 515:17 517:1 622:20 623:21 641:11 643:13,14 670:9		
		modern 412:8,9 493:4 493:6 589:19 627:17 667:9,17 668:15		
		modernize 419:6 667:6		
		modified 573:24		

439:18 440:4,6,13 442:7 443:14,14 451:11,17,18 456:10 456:22,22,22 473:1 473:4,5,9 481:20 492:20 493:16 494:4 495:3 506:14 508:14 535:3 546:21 561:7 562:8,12,19 564:16 565:6 572:8,9 573:20 585:18,19 600:21,22 611:12 624:15 629:9,10 630:24 631:20,21 632:6 634:2 635:11 637:1 645:22 651:3 654:23 655:13 656:12,23 657:16 660:4,17,19,21,23 661:2,9 662:11 663:12,19 665:17 668:6,15 669:1,19 669:20,24 670:4,10 671:4 new-hires 456:10 new-service 470:5 newer 660:24 newness 640:9 news 501:14 NG 585:8 NG-1 527:8,9 529:23 676:6 NG-12-1 618:10 NG-AS-DM-Rebutt... 397:2 398:15 NG-AS/DM-Rebuttal 636:8 NG-DSD-2-BOS 518:4 520:18 521:19 610:2 NG-DSD-2-COL 521:20 608:9 NG-DSD-2-Colonial 519:12 NG-DSD-5 522:8 523:17 NG-DSD-7 522:20 NG-DSD-7-COL 514:9 NG-GBE-1 556:21 558:18 NG-GBE-3 622:9 NG-GBE-5 585:15 587:6 598:8 NG-GBE-6 631:5 NG-GBE-Rebuttal-1 557:6 558:20	NG-GSRP-1 396:18 NG-RRP 512:23 NG-RRP-Suppleme... 533:3 NG-RRP-Suppleme... 508:1 525:7 614:5 NG-SA/DM-Rebutt... 638:6 Niagara 611:11 612:22 613:1 nice 658:13 Nick 656:7 Nicole 399:9 night 453:12 nine 587:23 593:11 595:24 640:6 non-connectivity 414:2,10 415:5,6 non-IS 642:24 non-salary-related 548:24 nonlabor 548:6,13,17 549:4 nonmetallic 472:5 nonunion 399:20 459:6 normal 463:5 632:22 633:20 671:2 normalization 525:16 525:20,24 526:1 527:17 528:2 normally 443:7 475:9 North 394:4 note 431:16 476:24 573:13 587:11 672:22 673:6 notes 433:11 634:13 634:16 notice 521:5 November 396:14 475:2 476:21,21 477:22 478:15 479:2 479:20 480:15 514:13 556:17 number 397:15,16 400:7 408:1 410:11 410:22 416:17 420:16,18 421:16,16 422:15 426:9,11,23 431:17 438:18 440:8 440:12 441:21 442:5 444:24 447:7 448:21 450:2,3,3,4 455:8 456:4 460:14,19 461:4,19,23 462:16 462:22 463:24 464:4 464:18 465:21 467:2	467:5,19,23 469:7 469:22 470:9 480:10 482:20 498:3 503:12 503:14 514:22 515:22 516:4 518:7 518:14 519:14,15 520:12 521:5,6 522:7,16 523:11,22 525:13,13 528:1 530:22 531:1,2 542:23 557:19 595:12 597:11 606:14 608:16 609:9 609:21 610:5,22 612:8 613:13,15 614:19 616:17 618:5 618:12,16,20 639:23 640:10 649:22 652:5 656:22 numbers 448:10 449:16 459:10,13,13 467:18,21 468:5 519:17 520:1,3,4 522:11 524:16 537:2 619:5,21 nursing 475:6 NYC 585:19 <hr/> O O 393:2 O&M 497:14 498:13 498:18 499:8,14,20 499:24 500:4 615:13 615:17 617:11 619:2 619:6 object 417:22 objections 511:12 objectives 583:3 objects 656:23 obsolete 647:20,23 obtain 467:9 obviously 419:5 540:18,22 542:19 656:17 occasionally 446:5 occasions 494:7 occur 417:11 447:22 501:15 632:1 occurred 468:15,16 468:22 469:10,12 477:21 481:5 501:13 550:14 occurring 416:6 501:6 occurs 417:11 October 510:17 513:6 offer 457:6	offered 404:21,24 405:2 435:4,8 438:16 office 392:7,16 394:17 442:20 443:8 528:22 548:16 569:3 622:14 627:19 officer 390:14 393:12 511:8 529:4 674:3 offline 494:6 664:7 665:14,23 oh 649:15 OJT 445:1 okay 394:20 395:11 401:12 410:9 419:14 426:9 427:3 433:6 444:12,15 446:10,22 449:17,22 450:5 454:15 487:21 513:1 514:10,21 517:22 518:6 525:5 555:2 574:24 578:1 615:23 630:5 639:2 Okey-doke 435:4 old 490:7 624:13,17 651:3 656:11 660:5 660:6 663:13 667:10 667:10,16,20 668:11 669:2,2 older 412:2 417:7 432:2,15 472:16 491:19 493:8 654:9 older-school 598:22 on-the-job 442:8 445:2 465:4,6 633:12 once 409:24 410:12,23 430:1 501:10,11 539:4 601:16 631:6 646:8 658:3 664:8 one-way 475:5 ones 574:21 669:2,2 ongoing 399:23 400:2 466:24 646:9 647:5 OPEBs 551:14 open 454:11 455:1,5,8 460:2,14,16 461:4 583:19 666:19 opening 476:15,17,19 477:7 OpenText 590:19,21 590:23 591:3,5,11 593:17 operate 475:10 666:10 operated 475:18 651:7	operating 403:13,16 403:20,22 404:2 427:20 435:14,17 459:9 461:20 467:6 482:9,12,14 484:1 497:21,24 498:20,23 499:1,10,17 515:15 541:9 544:13,16 549:22 550:13 622:19 623:21 646:1 operation 632:22 638:10 operational 588:14 636:22 654:2 operations 429:15 445:22 497:9 509:22 523:5 566:5 587:5 636:20 657:21 operations/CMS 600:15,20 602:7 opex 497:17 499:6 613:3 617:17,17,19 618:1 opportunities 651:7 656:24 opportunity 478:8 603:8 612:23 613:5 633:24 opposed 461:3 466:12 536:7 optimal 631:24 optimization 651:12 652:23,24 654:18 optimum 632:7 oral 473:19 order 479:11 480:4,21 488:9 489:17 498:2 498:7,11,17 499:2,7 499:10,13,13,19,23 500:4 582:6,18 583:17 651:16 652:19 664:12 orders 406:7,9 408:24 409:6 479:13,14 492:24 546:3 582:4 627:23 651:14 organization 466:15 566:10 586:11 648:23 668:17 669:6 670:19 organizational 630:20 organizations 626:8 organized 444:20 orient 650:1 original 437:23 522:13 606:5 609:19 660:13
--	---	---	---	---

Osborne 390:16 393:14 524:8 675:15 outage 416:20 outages 416:8,16,17 outdated 624:14 641:2 outliers 536:12 540:11 output 516:4 outside 442:19 460:2 527:24 534:13 538:17 548:6 overall 444:9 519:1 530:9 552:22 585:10 610:10,11,13 622:20 overdoing 645:2 overhead 534:4 538:12 549:17 overheads 536:7 543:6 544:4 551:22 554:12 oversee 462:22 overseeing 465:8,20 overseen 465:19 oversight 550:22 overtime 483:6 484:9 485:3 496:13,18,22 496:24 497:2 500:3 owns 491:7	572:22 575:9,10,11 575:12,16 576:8 578:2 580:15 587:20 588:4 589:3 590:1 590:18 591:13 592:8 592:17 595:11 605:19 606:10,20 607:6 608:17 613:11 614:5 620:24 624:6 625:16 635:24 636:1 636:7,11,12 640:21 641:8 649:20 650:4 650:4,7 654:5 657:10 658:20 659:23 662:11 Pages 390:1 440:2 445:14 pair 650:2 Pamela 506:22,24 675:9 panel 394:2,3 396:13 424:23 425:7 427:14 428:2,19 429:7,22 430:24 431:2 435:3 452:23 453:15 454:1 454:7 459:21,23 460:7,10,11 462:9 481:8 489:8 491:2 493:13,22 495:2 512:12 514:4,7 525:6 555:14 556:16 624:2 paper 628:22 636:3 636:14 659:4,10,15 659:18,21 paragraph 631:18,20 pardon 649:22 Park 481:5,7 parse 468:6 part 396:13 401:10 430:20 431:11 436:6 442:22,22 443:13 462:5 464:6 485:1 487:16 493:24 529:7 529:9 530:9 539:22 543:2,6 544:20 556:14,15 558:16 565:13,15 570:9,24 571:3,6,16 572:4,10 572:19 573:4,10,15 573:20,23 575:22 576:14,19 577:7,24 578:4 579:8 581:16 582:14 585:6 588:1 588:8 590:2,21 591:17,19 592:11,21 593:12,20 596:1,4,9	604:12 606:8 619:2 623:14 624:14 625:18 629:10,11,12 634:19 637:2 641:1 644:7 645:11 646:14 646:15,16 656:9 657:2,24 662:7 663:10 666:24 670:11 partially 447:17 participate 430:18 445:4 participated 402:21 405:16 particular 408:22 464:22 495:20 498:7 499:12,22 525:13 595:20 616:15,16 625:16 636:12 637:17 641:17 654:21 659:20 663:2 particularly 419:23 637:3 parties 535:23 partly 446:18 parts 579:10 584:2 596:19 640:19,20 641:18 party 540:19 623:15 pass 526:10 566:19 626:1,24 passing 525:10 patch 501:23 path 624:16 643:4 Paul 390:16 393:14 pavement 462:19 payable 536:9 paying 670:12 payments 614:21 payroll 495:17 536:9 pays 551:9 PBOPs 551:13,14 554:8 peers 566:4 penalties 614:16,19 penalty 526:1 pending 455:1,1 Pension 551:13 pensions 554:8 people 395:7 421:13 430:3 456:20,21,22 457:17 486:20 599:15 614:17 624:5 625:14 626:15,20 627:14 629:8,8 633:19,22 634:11 635:4,11 637:19	638:15,24 639:12,13 639:16,19 640:4,5,7 655:22 659:9 664:17 667:9 672:13 people's 659:7 per-company 514:11 percent 437:20 455:14,19 517:24 518:10,13,22 522:4 539:1 540:2 544:2,6 553:11,19 616:19 619:7 650:16,17,20 651:9,19 652:5,10 652:20 653:18 percentage 436:16,18 436:23 437:9 522:3 534:8 539:3 543:21 544:9 549:21 553:1 553:11 percentages 540:14 perfect 395:9 634:12 664:16 perfectly 472:23 perform 463:5 465:17 477:12 480:24 487:8 495:20 534:7 535:1 565:19 580:1,12 performance 565:7 632:15 633:4,15 634:1 649:17 performed 433:24 435:12,16 437:9 466:2 469:5,19 479:11 486:1 489:21 534:6,12 537:6,7 541:3 547:16 631:24 performer 634:14 performing 435:5 461:24 476:12 481:11 540:7 period 410:24 411:1,6 437:12 450:8 460:19 501:4 524:18 525:11 526:11 541:21 542:3 585:12 610:14,15,17 634:6,7,18 645:15 periodic 417:12 permits 576:9 person 399:22 462:7 509:17 628:13,18 639:9,11,11 personally 434:3 447:24 478:17 565:21,22 personnel 414:18 420:10,13,21 421:8 425:15 426:4,7	434:7 448:11 455:20 459:6 468:4 503:23 504:13 667:21 perspective 458:14 652:9 669:6 pertains 611:18 pertinent 489:22,23 Peter 532:5,6 533:17 675:18,20 petition 393:5 phased 586:21 587:11 604:2 639:22 phases 444:10 535:9 535:12 577:13 phone 413:2 418:23 452:6 453:12 491:22 653:14,16 666:14 physical 574:11,13 piano 634:12 pick 628:3 picked 554:2,7 piece 418:17 504:19 546:2 619:20 621:14 621:16,24 622:5 623:13 643:1,2,2,5 658:1 659:20 pieces 447:3 597:13 619:3 661:20 Pieper 390:14 393:3 393:11,24 394:14,21 395:9,19 399:3 401:2 402:11,23 403:7,10 404:5,9 405:10,20 408:1,10 409:5,9 410:19 411:1,3,8,11 414:6 415:1,7 416:22 418:19 419:14,18 421:21 427:8 434:16 437:12,15,21 438:23 439:2,20 440:15,19 441:20,23 442:10,15 449:3,6,20 450:18 450:22 451:3,5,23 452:2,7 461:14 462:8 466:5,9 467:7 467:12 468:8 470:19 470:22 473:24 474:21 477:23 479:17,22 480:16 484:4 485:7 487:21 500:6 502:22 503:1 503:11,17 505:7,19 506:1,4,9,13,19 507:5 509:4 511:12 511:19 512:1,7,10 512:16,19 514:4
P				
P 393:2 p.m 673:15 PA 534:13,21,24 537:8,12 539:1,8,17 540:3,20 541:15 547:16 549:19 package 596:14 packaging 472:16,16 473:5 Packard 452:17 page 399:13 400:17 401:6 405:23 409:11 415:17 427:12 429:13 435:12 439:23 440:24 445:5 445:9 451:22 453:1 454:3 464:23 470:17 470:24 474:24 480:23 481:3 516:13 516:15 517:20 518:5 519:4,12 520:18 522:8,9 525:6,8 538:6 547:15 549:5 549:11,15 567:19,21 570:12 571:8 572:15				

515:5 516:6,11 518:17,20 519:24 520:15,24 521:10,22 523:15 524:1,6 527:2,7,11 528:17 529:3,7,12,14,18,22 531:10,21 532:2,10 532:23 533:15 534:15 538:2 545:5 546:20,23 554:17 555:4,9,12,16 560:1 562:23 563:7 574:4 574:7 578:22 605:20 606:7 607:7,22 608:1 613:18,21 615:6 620:21 624:23 636:6,10 662:18,21 669:13 672:2,17,21 673:6,13 pike 647:1 pilot 430:10,18 443:12 590:4 piloting 658:8 pin 418:2 pinpoint 418:11 pipe 419:23 469:3 471:5,6,13,14,18 472:1,4,5 488:13,16 490:5 637:6 657:5 pipeline 398:6 462:18 462:19 463:24 pipes 490:11 pipng 446:7,13,13 471:11,17 place 392:8 425:15 451:18 467:24 483:19 501:19 513:12 570:18 626:6 649:3 666:13 667:14 667:15 668:15 placed 440:13 469:2 471:16 526:3 plan 430:21 458:12 464:18 483:7,10,12 483:16,16,19,24 484:2 513:23 543:14 551:19 570:7 602:11 604:21 639:23 planned 635:4 644:23 planning 396:4 482:21 579:1 622:6 plans 463:23 464:22 513:2 602:17 603:22 603:24 604:7 plant 524:21,22 525:4 526:15,19 547:4,8 548:12	plastic 471:2,11,12,17 471:18,24 472:4 platform 574:22 578:17 581:7,12 583:2,5,20 588:5,17 588:18,24 591:14,16 592:1 593:9 644:4 645:3,4,7,12 platforms 576:2,18 577:11 623:11 play 619:24 634:13 playing 634:12 please 395:11 402:10 495:14 512:23 514:8 518:3 532:3 544:24 549:16 554:15 567:18 571:8,19 575:8 576:8 578:2 580:14,23 587:21 605:19 606:20 607:6 608:8 615:21 619:1 619:4,22 620:16,24 624:6 631:15 658:17 658:19 671:21 plots 408:24 409:6 point 417:24 418:1 444:13,19 450:19 457:22 538:24 562:23 573:13 585:8 594:9 596:5 601:8 606:2 607:7,8 612:19,20 627:7 634:23 637:9 644:16 645:21 660:11 664:17 667:2 671:16 pointing 585:15 points 602:18 628:8 669:23 policies 477:6 policy 542:15 poor 413:1 populate 656:12 portfolio 622:2,14 portion 409:3,5 519:5 548:10 552:16 553:21,23 612:14 PORTIONS 677:21 position 396:1,3,6,7 398:4,8 399:24 400:5,9,12,13 440:14 463:21 507:13,18,19 508:12 508:17 532:16,21 556:5,9 558:6,11 583:19 632:7 647:22 positions 454:11,24 455:4,22,24 456:4,9	456:10,15,20,24 457:3,5,8,9,16,17,19 458:15 460:2,2,3,4 460:15,16 461:4 464:4,22 567:11 positive 628:5 possible 393:20 424:7 498:16 528:11,12 605:6,9 621:5 625:8 671:8 possibly 600:3 post 456:24 458:8,16 584:21 634:24 635:2 post-GBE 648:14,21 649:2,8 post-go-live 638:12,13 post-installation 465:24 post-test-year 458:14 posting 505:2 potential 669:22 potentially 445:3 459:22 461:9 Power 516:20 517:1 611:11 PowerPlan 572:23 573:1 practice 454:24 464:12,15 476:14 484:20 505:13,20 546:18 629:20 633:9 634:9,11 practices 482:22 543:8 practicing 634:16 pre-exist 456:9 preceding 463:17 483:20 predominantly 442:6 580:4 584:13 prefiled 396:12,16 397:7 500:10 556:15 556:19,24 557:11 558:17 559:3 607:10 premise 670:14 preparation 396:9 398:10 508:19 556:11,14 558:13,16 prepare 396:12,21 398:13 507:20 556:15,24 558:17 397:2,17 398:18 452:24 491:3 508:2 533:6 556:21 557:6 557:21 558:22 559:13 668:19	preparing 478:7 prepopulate 659:7 present 411:7 450:5 460:24 468:1 president 396:3 398:6 558:8 564:2 presidents 566:5 pressure 475:9 presumably 544:10 pretax 519:13 pretty 545:7 548:21 579:7 628:4,5 642:22 prevent 543:8 prevention 421:14 422:3 440:4,6,7,14 446:6,14 631:3 650:10 652:10,16 previous 614:1 618:18 previously 412:16 431:9 464:9 pricing 394:2,3 514:2 514:4,7 primarily 536:24 634:9 primary 489:12,20 669:6 Primavera 576:22 principal 442:24 443:2 principally 537:5 542:2 550:6 principle 626:13 prior 448:8 463:13 480:4 504:10 505:5 542:15,18 546:19 567:15,24 569:21 629:2,15 633:2 635:4 646:18 658:5 660:11 priority 525:15 privy 430:23 464:21 pro 538:11 probably 417:24 458:15 485:14 513:14 548:22 584:20 590:14 608:22 616:22 617:2 622:10 problem 395:8 411:16 413:5 453:11 481:1 666:4 667:12 problems 414:4 415:9 424:11 425:13 662:24 663:2,5 procedural 393:16,24 394:23 395:10	procedure 482:10,12 482:14 procedures 400:22 403:14,16,17,20,23 404:2 406:10 476:16 proceed 395:19 399:4 451:7 507:7 509:5 529:18 532:10 533:16 560:2 600:10 608:2 613:23 624:24 662:22 proceeding 397:24 441:7 477:17 483:13 508:8 510:13 533:4 558:3 559:20 561:16 561:21 611:11 proceedings 561:11 564:12 674:4,6 process 400:15,16,18 425:5 441:17 456:2 481:13 536:15 578:18 581:9,13 599:16 625:18 626:9 627:23 630:2,21 632:16 639:18 643:23 644:3 649:7 649:10 processes 400:19 579:2 629:19 631:23 produced 477:16 produces 588:20 product 598:14 599:23 600:6,12,16 601:1,24 productivity 632:19 633:11,14 products 474:19 597:15 599:5 program 399:18 400:17,18 401:7 404:22 405:9 423:18 427:18 429:14 430:10,18 434:12,13 442:23 443:1,3,22 459:8 465:22 467:17 467:19 468:3 492:8 492:11,16,22 493:17 493:24 494:18 560:7 560:17,22,24 561:2 561:11 563:16,18,23 565:3,11,20 566:11 567:24 568:11 569:21 571:1,3,17 571:23 572:5,10 573:5,11,21,24 574:17,18 575:5,6 575:23 576:3,6,15
--	--	--	---	---

577:8,10,13,19,24 578:5 579:8 581:17 585:10 586:20,22 587:3 588:1,7,8 589:17 590:22 591:4 591:9 592:2,6,12,18 592:22 593:5,13,20 596:2 598:11 603:10 604:23 605:16 606:13,23 608:5 610:9,12,20 611:18 611:23 612:17 614:14 615:11 616:10 622:2,3,17 622:20 623:12,15,18 624:9 626:15 627:19 635:22 637:16 638:15,16 639:8,10 639:23 640:2 641:10 641:17 643:1 646:14 648:13 654:13 656:9 658:22 659:1,6,11 659:19 671:5,8 program's 623:16 641:2 programmer 639:10 programs 442:8 494:10 591:8 593:19 494:4 651:5 progress 504:3 545:17 547:7 project 474:12 491:20 494:16 498:13,14 516:17 517:3 524:15 530:9 535:13,15 539:16 603:23 projects 407:15 466:24 497:8,9 535:10 542:23 543:1 546:4 651:11 promise 471:21 480:19 587:17 prompts 497:3 property 583:22 proportionate 615:1 proposal 419:6 611:10 612:16,20 proposals 666:8 propose 510:21 513:18,20 528:10 proposed 505:23 510:8,24 511:5,6 531:17 612:18,21 613:6 proposing 425:9 492:6 526:10 609:16 610:3	propounded 397:11 557:15 559:7 proration 527:21,22 prospective 545:8 protected 525:11,16 525:17 protecting 642:17 protections 612:9,15 613:4 protective 395:1 provide 393:18 400:21 402:11 405:3 409:19 410:9,13 415:14 425:1,8 429:8 436:1,2 437:17 438:20 459:12 461:1,23 462:3 465:3,6 467:21 474:3 486:18 488:4 489:5,13 491:9 492:19 493:4 493:14,22 520:11,20 520:22 521:13 523:10,11,18,20 535:7 537:23,24 546:21 549:2 554:14 554:15,20 564:10,20 569:4 582:24 583:9 595:3,7,9,23 597:17 600:3 614:17 619:10 619:22 625:24 631:9 632:9 633:22 634:21 655:7 provided 401:11 402:2,5,15,22 403:24 404:3 405:13 405:19 422:4 428:24 429:21 434:1,10,14 434:15 438:10,13 439:5 440:4,13,18 441:6 447:9 448:19 453:16 459:24 460:1 474:17 483:13 488:11 489:11 497:15 503:9 510:23 511:4 517:7,8 535:11,24 536:2 537:9,12 538:20 561:6 562:13 564:15 564:15 570:1 595:17 625:19 634:7,19 646:16 672:13 673:9 providers 644:3 provides 433:13 445:21 488:8,12 489:17 490:3 551:7 599:12 644:7	providing 422:9 461:21,22 486:13 490:2 516:7 554:18 654:14 provision 524:22,24 666:3 prudent 647:13 668:16 PSC 562:19 psi 475:12,18 public 390:3,6 395:7 562:12 611:12 665:8 published 472:12 473:1,9 publishing 473:4 PUC 561:16 pulled 652:17 pulling 653:16 purely 596:14 purpose 472:18 482:21 545:9 purposes 471:7 476:10 552:9 640:1 pursuant 393:7 512:8 672:22 push 603:18 pushed 546:2 604:20 605:7 put 459:10 468:12 473:15 513:18 539:22 599:6 605:12 615:3 628:7 645:20 646:13 651:13 653:7 660:13 667:11,17 668:15 putting 471:6 637:14 645:9 667:14,14,16	493:21 494:17,23 495:1 500:18,21,23 503:5 505:9 515:8 521:5 522:1,17 526:23 527:3,21 544:22 546:12 549:16 561:22 566:14,16 588:3 602:15 607:13 608:4 608:23 609:24 610:1 614:1 617:5,7 618:9 618:18 619:8 622:7 636:2,23 638:12 639:2 641:5 654:6,7 671:12,22 questioning 437:24 524:11 646:19 questions 394:7,13 403:1 414:8 427:11 449:24 451:1 453:15 454:14 459:20 460:11 461:18 485:10,11,12 505:8 506:5,5 507:10 512:17 517:6 524:9 525:5 527:1 528:18 534:2 536:4 555:9 560:7 575:15 611:5 614:12 615:5,10 624:21 629:21 635:23 638:18 649:23 654:4 672:16 672:18 quick 500:8 608:3,15 609:24 quicker 501:17 633:9 653:1 quickly 481:1 526:6 611:6 633:2 658:16 662:17 671:8 Quiles 480:22 quite 397:16 402:23 418:7 599:18 626:6 672:24 quote 632:10 quoting 415:15	range 453:3 540:16 ranges 470:10 rank-and-file 430:7 430:10 rate 394:19 396:4,10 398:11 455:14 459:10 508:20 510:13 517:24 522:23 530:7,18 531:1 532:18,19 543:13,17,18,21,23 544:2 556:12 558:14 561:6 620:11 rate-case 610:17 rate-year 619:10 Ratepayer 392:7 rates 390:15 393:10 393:14 483:2 510:5 510:9,12,17 513:21 520:21 ratio 421:12 422:18 552:14 ratios 552:19 RDM 528:9 RDR 390:20 674:10 reach 400:14 445:3 read 405:11 410:17 500:19,21 readily 420:5 467:22 readiness 558:8 564:2 565:5 reading 410:20 415:2 reads 517:24 ready 626:20 631:16 668:20 real 599:13 613:5 638:20 670:9 real-time 613:2 654:14 reality 637:20 realize 575:14 593:16 625:4 realized 485:7 reallocates 549:6 reallocation 549:7 550:9,11 really 401:3 459:9 462:4 511:13 536:9 541:17 549:1 586:11 588:18 589:19 599:19 600:2 601:7 612:9 614:6 616:23 621:14,16,20,23 622:3,4,14 623:4,6 623:14 628:3,4 640:8 642:21 644:10 650:23 651:9 652:14
--	--	--	---	---

656:14 659:2 663:24 672:11 reapplies 549:7 reason 410:5 414:14 485:8 521:8 522:24 524:19 525:12 550:19 552:20 596:4 reasonable 418:12 485:15 540:16 reasonably 414:22 reasons 410:6 413:4 447:21,21 448:5,5 rebuttal 396:21,24 397:7 398:13,17,23 460:7,9 528:24 556:24 557:4,11 558:19 559:4 562:1 562:4 564:20 recall 422:9 433:12 529:12 605:21 663:7 receive 438:5 491:11 491:21 492:20 494:5 504:15 539:5 648:2 664:8 received 438:2 504:24 672:23 Recess 451:4 502:24 555:15 613:20 recipient 541:14 recognition 504:22 recognize 510:24 511:5 530:11 recognizing 655:16 recommended 549:20 reconcile 520:23 522:23 523:24 reconciliation 513:13 reconciling 510:9 record 393:3 395:7,12 401:18 402:9,24 403:4,10,12,21 404:5,10 405:7,8,10 405:20,22 407:23 408:5,10,13 409:2 409:10 410:15 411:11,13 413:24 414:9 415:3,10,11 416:11,22,24 417:17 419:18,20 426:16 427:8,10 434:8,16 434:21 437:8,21,22 438:15,24 439:2,4 439:15,20,22 440:11 440:15,19,23 441:7 441:11,20,23,24 442:3,10,16 449:18 451:3,6 456:7,14	460:13 461:14,16 466:5 467:4,7,11 468:8,10 470:19,21 470:23 473:18,24 474:2,16,21,23 477:19,23 478:1 479:22 480:16,18 483:23 484:4,6 495:14 502:23 503:2 503:10,17,19 505:17 506:1,3,11,12,14,16 506:20 511:10 512:17,18,20 514:3 517:19 518:18,19,21 520:11,24 521:2,14 521:22,24 523:10 524:3,5 531:23 532:1,3,4 537:9,11 538:2,4 543:16 545:2,6,12 546:14 546:24 547:1 555:4 555:6,16,17 562:7 562:21,24 563:2,5 571:22 573:13 605:4 607:22,24 608:2 613:19,22 617:5 618:24 619:3,19 620:21,23 658:8 662:19,20,21 672:3 672:22,23 673:7,13 674:5 676:8,9,10,11 676:12,13,14,15,16 676:17,18,19,20,21 676:22,23,24 677:1 677:2,3,4,5,6,7,8,9 677:10,11,12,13,14 677:15,16,17,18,19 record-request 563:9 recorded 530:13 545:10,13,14 549:21 552:23 553:14 records 406:9,12,18 407:17 408:8 416:2 416:5 426:7,17,20 426:24 427:1 428:14 428:24 429:6 433:1 433:10 434:9 447:20 456:4 489:10 490:12 490:14 500:11 501:5 504:7,8,9,14,16 505:1,14,24 636:3 636:15 655:21 656:3 656:4 recover 492:7 610:18 recovery 609:2 611:22 612:16	recruiting 455:10 redacted 395:6 redesign 441:1 442:7 redig 467:18,20 468:3 redigs 465:24 467:16 467:16,23 468:4 redirect 506:7 528:19 529:17 555:10 672:19 redirecting 566:7 redlined 510:24 511:5 reduce 425:12 428:5 445:15 501:18 530:23,24 531:4 reduced 436:9 502:3 530:5 650:12,13 reduces 633:11 reducing 450:12 reduction 504:4 530:14 531:6 650:16 650:17 652:10 653:18,19 Reed 455:13,17 refer 427:18 441:4 512:23 514:8,11 561:5 615:21 623:24 638:7 654:7 657:13 reference 511:10 512:2 514:20 525:9 referenced 631:5 referred 459:17 629:3 referring 432:2,11,14 432:15 435:19 481:3 481:4 494:12 516:19 519:4 542:16 561:8 587:4,5 609:5 636:14 648:16 662:10 refers 432:8 reflect 479:6 reflected 479:10 515:16 538:18,19 reflects 515:19 518:23 537:22 552:21 617:11 refresh 433:9 436:7 refresher 635:8 reg 531:5 regard 400:9 405:8 475:13 476:14 482:10 503:21 504:5 regarding 402:12 407:14 409:19 411:19,22 422:1 423:7 476:14 503:6 504:19 517:7 534:3 582:11 586:14	611:10 region 671:18 regular 400:24 496:13 496:18 497:2 623:16 644:17 regulated 549:22 regulation 628:23 regulatory 509:18 530:3,15,23,24 532:19 547:24 Reihaneh 555:19,21 626:2 628:7 675:22 Reihaneh's 627:7 reinstate 647:22 reinstatement 416:20 reiterate 585:23 reject 539:15 relate 427:12 related 414:20 431:18 446:24 447:15,17,18 447:18 464:13 472:21 523:4 538:15 550:6 591:3 617:7 654:19 663:5 relation 616:15 relationship 452:18 460:7 relative 419:3 423:10 relatively 633:2 release 476:6 481:14 598:14 600:6,11,20 601:1,2 602:18 626:14,23 633:2 634:23 640:4,6 644:21 648:8,9,22 release/enhancement 600:7 released 601:6 releases 604:3 644:22 releasing 630:15 relevant 419:5 reliability 396:13 667:19 reliance 663:6 remain 429:24 451:6 507:6 570:18 613:22 662:12,22 remaining 526:19,21 531:16 662:9 remember 406:4 478:4 561:14 564:13 605:24 remind 451:6 507:5 564:1 613:22 662:22 remove 667:18 removing 667:15	rent 615:13,16 618:7 619:11 rep 583:15 repair 425:17 478:16 481:16 489:19 498:21,22,22,23 525:1 repairs 437:1,4 524:23 repeat 421:6 446:8 484:16 500:18 658:18 repetitious 607:17 replace 409:15 412:8 492:16,23 493:18 494:1,10,19,24 578:7 580:20 660:5 660:6,7 663:13 672:13 replaced 425:3 439:9 439:18 491:20 494:4 657:19 660:22 662:8 663:10 667:1 replacement 436:14 437:7,9 459:8 461:21 462:23 464:1 465:9 466:23 467:5 501:7 651:5 672:7 replacements 434:23 435:6 448:2 462:1 465:16 471:3 replacing 579:6 651:3 661:20 667:16 671:14 report 423:14 504:1 535:10 536:18,19 537:12,17,20 539:5 539:22,24 540:1 554:18 reportable 476:9 reported 447:2 553:9 Reporter 390:20 REPORTER'S 674:1 reporting 429:16 544:20 546:12 552:8 588:18 reports 539:2 588:20 Reppucci 392:5 560:4 560:5 562:6 563:6 607:19 608:13,20 609:1,7 611:4 615:5 669:16 671:21 672:15 675:24 676:3 represent 455:19 625:6 631:22 represented 461:8,12 464:4 519:2
---	---	---	---	--

represents 514:17 518:12 538:15 reps 416:3 583:4,9,11 request 401:18 402:9 402:24 403:4,11,12 403:21,24 404:6,10 405:7,8,21,22 407:23 408:5,11,13 409:2,10,20 410:15 411:12,13 413:24 414:9 415:3,10,11 416:11,23,24 417:17 419:18,20 421:23 425:23 426:16,21 427:9,10 434:8,17 434:21 437:8,21,22 438:15 439:3,4,15 439:21,22 440:11,16 440:20,23 441:7,11 441:20,23,24 442:3 442:11,16 449:19 453:13 456:7,14 458:5 459:13,15 460:13 461:15,16 467:4,8,11 468:3,9 468:10 473:18 474:1 474:2,16,22,23 477:19,24 478:1 479:14,23 480:17,18 483:23 484:5,6 485:15 503:10,18,19 505:17 506:2,3 514:3 520:11,24 521:2,14,23,24 523:10 524:3,5 537:11 538:3,4 545:2,6,12 546:14 546:24 547:1 555:5 555:6 561:8 562:7 562:21,24 563:2 564:12,13 617:5,8 618:24 619:3,19 620:22,23 624:3 631:15 640:17,19 641:1 673:5,11 676:9,10,11,12,13 676:14,15,16,17,18 676:19,20,21,22,23 676:24 677:1,2,3,4,5 677:6,7,8,9,10,11,12 677:13,14,15,16,17 677:18,19 requested 406:2 410:16 441:10 459:24 requests 397:10,15 411:21 422:1,13	448:23 508:23 557:14,19 559:6,11 642:16 672:23 673:7 673:9 676:8 require 463:9 required 426:12,19 504:13 513:22 596:7 599:21 requirement 393:19 464:14 515:17 519:1 520:6 531:15 538:23 543:19,22,24 552:10 552:21 610:13 612:3 614:2 620:9,12,13 requirements 390:15 393:15 508:15 514:19 552:17 598:23 608:10 610:8 611:2 618:3,11 619:6,9,13 requires 647:2 reserve 453:21 reserves 525:11 526:9 reside 539:1 578:19 467:4,8,11 468:3,9 resiliency 667:19 resolve 413:10 414:4 415:9 665:7 resolved 637:11 639:1 resource 396:4 539:17 resources 448:24 599:24 respect 396:16,24 398:17 507:24 556:19 557:4 654:18 654:21 respectively 482:6 respond 437:1,4 485:23 487:3 583:18 608:22 616:22 653:22 responded 411:21 448:23 responder 485:20,22 responding 485:16 566:3 580:6 response 415:13 427:22 431:10,15 432:8 433:7,8,13 441:6 447:8 449:15 456:13 459:3,13,16 462:21 528:1 561:14 562:4,21 563:1 611:9 616:5 617:8 617:10 618:10,14 619:19,19 620:17 624:2 631:15,18	632:12 636:2,11 640:17 646:18 654:6 657:9 660:12 responses 397:14,17 397:23 415:13 422:6 453:23 511:24 512:4 557:18,21 558:2 559:10,13,19 560:10 563:9 640:21 646:16 responsibilities 399:13,15 509:15 responsibility 462:6 509:12 responsible 413:17,20 413:23 414:1 415:4 429:1 436:3 438:4 509:21 516:21 561:2 565:4 responsive 486:21 rest 525:5 592:4 restate 544:18 545:3 546:7 restated 547:4 restatements 545:21 restating 546:18 result 477:14 529:20 539:21 544:17 545:22 546:18 547:9 552:7 568:11 652:20 resulted 553:13 resulting 424:10 results 474:8 535:7 536:13,17 538:21 540:1,2,15,17 545:16 546:19 549:16,19 553:13 return 509:16 518:12 519:13,13,15 524:18 524:20 530:18 531:6 546:21 returned 526:5,6 530:19 returns 520:21 546:9 revenue 390:15 393:15,18 508:14 513:8,11,16,19 514:12,17,19 515:12 515:14,15,17,18 519:1,2 520:6 531:14 538:23 543:19,22,24 552:10 552:16,21 608:10 610:8,13 611:2 614:2 618:3,11 619:6,9,12 620:9,11 620:12	revenues 515:16 reverse 525:18 530:23 reversible 528:4 review 403:16 459:23 478:12 479:4 530:9 578:13 598:8 reviewed 455:15,16 504:10,17 530:8 reviewing 422:12 reviews 504:9 623:16 revised 504:17 517:7 518:3 520:2 521:7 521:12,18,21 522:14 609:14 610:5 revision 518:4 522:8 523:3 538:6 608:9 610:2 RFP 441:18 442:1,4,4 442:13 Rhode 561:7,16 562:5 564:16,20 585:17 600:16,21 601:2,5 601:13,21,21 602:4 602:9 603:15 626:22 628:2,21 632:24 635:10 656:20,22 658:9 RI 585:16,17 rid 657:18 ride-along 653:5 right 414:7 443:6 444:17 449:21 450:20 451:21 463:7 466:24 487:19 502:5 510:10 511:17 523:16 528:13 548:15 560:17 564:6 569:17,22 570:2,19 571:1 579:14 580:21 581:17 584:8 587:2 588:8 589:7 590:16 593:22 595:7 597:3 598:5,11 602:1 603:19 606:3,7 609:8 610:1,24 623:17 628:18 631:20 634:5,12 643:1,21 649:4,14 650:5,14 653:5,12 660:23 667:5 671:10 rightmost 659:24 rings 582:16 583:13 risk 463:8 645:10 648:1 666:15,16 risks 400:21,21 road 391:17 441:2,12 441:19 442:6,11,12	442:17,18,21 443:11 443:14 444:9 583:7 585:9 588:22 589:1 598:10 602:15 603:15 604:10 627:9 629:3 644:8,12,23 657:14 671:13 Robert 390:13 393:13 Rogers 392:1 394:18 418:23 487:23 500:8 500:19 502:19 509:7 511:8,16,21 512:5,9 512:11 527:13,15 528:15 531:13,20 675:7,12,16,17 Roitman 392:18 role 399:22 465:20 560:15 563:19 564:5 565:3,10,13,19 567:15,16 585:6 586:14 630:14 631:10 639:11 649:15 roles 563:14 629:22 630:13 639:5 roll 601:10 658:1 rolled 443:16,18 444:6 583:8 585:22 587:1 628:16 637:2 641:3 660:10 661:9 rolling 425:5 640:9 657:15 rollout 430:20,22 584:1 588:15 600:4 639:22 657:11,11 rollouts 604:9 rolls 552:20 640:2 room 452:14 502:18 root 469:5 Roslindale 481:5,7 roughly 422:18 451:18 route 645:8 651:16 652:23,24 654:18 routinely 484:8 routing 409:13 654:15 row 570:14 571:8,11 571:19 572:7,22 573:7 575:8,18 576:8,21 RTB 646:11 670:20 rules 525:24 672:23 run 417:20 492:4,4 629:18 647:8,16 648:7 658:10 664:9 run-the-business 670:7 671:6,9
--	---	--	--	--

running 586:9 588:20 623:16 627:9 647:5 669:4	605:23 606:11 613:13 617:1,10 625:18 632:5 635:12 638:7	522:22 529:14 549:17 566:6 569:3 570:14 572:15,22 575:16 576:8 580:4	472:6 490:5,8,11 498:8 507:14 508:13 515:17 517:10,15,20 527:11 532:17 541:3	side 621:15 657:5 sign 659:5 signal 664:5,10 signed 602:3 significant 424:4,5 440:24 445:10 449:8 476:5 481:14 513:17 513:20 565:12 596:6 631:22 648:11 651:6	
ruptured 476:3,4	scale 610:11	583:21 585:10 589:3 590:18 591:14 592:8 592:19 599:17 600:15,17,20 601:17 601:22 603:4,14 604:4 606:10 607:19 608:23 609:11 615:2 617:3 621:3 623:20 624:4 625:20 627:11 628:5 629:13 631:21 632:2 636:4 640:11 645:13 650:9,10,16 650:17 651:4,13 652:20 654:10 655:10 657:22 660:2 660:16,21 662:17	541:4,8,11 544:17 545:3 548:4 556:6 562:12 569:6,13,16 569:21 570:8,21 571:13 572:1,12,16 573:1,8,17 575:20 576:11,22 577:5 579:23 580:3,10 581:23 582:12,23 586:15 599:6 611:12 619:16 641:10	significantly 441:3,13 442:12 666:17 similar 531:3 544:12 564:9 588:14 589:13 591:7 612:18 622:7 649:10 652:2 service-company 615:13,16 services 429:10 439:9 439:18 443:16 445:18 446:11 453:16 462:24 463:3 463:5,9,19 464:10 469:17,19,20 470:11 485:21,22 490:6,9 491:10 548:6 595:16 600:3 636:4 663:15	
rushing 575:13 624:5	scan 505:14	666:16,21 662:17 seeing 603:11 633:12 661:6 seen 397:10 472:21 557:14 559:6 608:23 627:2 628:1 634:8	service-company 615:13,16 servings 668:22 sessions 435:13,16 set 496:19 516:3,6 528:17 614:19 settled 562:19 settlement 611:10,17 611:21,22 612:7,9 settlements 498:17 seven 410:1 436:10 453:7 500:13 535:14 640:5 seven-day 486:23 severity 485:24 shape 647:16 share 644:24 sheet 518:23 520:4,9 523:17 546:8 sheets 520:19 shift 649:4 shifts 483:6 484:11,12 short 580:8 614:6 625:5 630:18 shorten 633:1 show 501:8 518:7,9 521:7 531:14 657:14 showed 585:9 showing 393:21 shown 604:10 632:24 shows 522:19 530:21 531:1 571:9 627:9 629:3	similarity 581:23 585:6,21 586:21 592:3 simple 653:15 simpler 420:12 simplest 501:19 599:6 simplicity 614:9 simply 635:3 673:10 simulations 629:18 single 663:17 sir 650:1 659:13 sit 406:11 437:24 450:1 460:14 464:17 478:19 604:22 610:19 668:3 site 480:5 655:22 sites 467:6 sitting 390:12 423:23 situation 424:7 468:14 469:10 470:4 476:7 665:10,24 six 486:23 508:18 525:1 sixth 393:4 size 610:11 sketch 435:4 sketches 407:10 409:14 434:14 435:18 438:2,4,5 sketching 431:7 434:1 434:10,23 438:16 439:8,17 446:19 skip 427:14 slide 606:21,23 slight 520:8 slightly 521:6 slow 575:12 small 527:23 528:1 550:3,5 553:7 601:9 smaller 436:21 smart 642:22	
S	scanned 490:12,14 505:24	Segal 392:18 segment 475:5 select 400:15 639:20 639:20 selected 467:19 selection 525:12 self-healing 656:6,8 send 504:16 sense 521:13,15 524:6 525:9 542:24 544:21 634:18 652:8 658:11 sent 395:4 489:1 490:19 527:11 sentence 436:8 631:19 636:13 separate 542:5 619:21 separately 457:1 598:3 serve 596:17 599:21 634:1 647:13 served 422:18 427:13 server 411:15 service 393:10 395:4 399:17 400:10 407:10 416:20 428:3 433:15,21 434:23 435:5 437:11 439:19 443:24 448:2 454:18 460:17 461:21,22,24 462:1 464:1 465:9 465:16 466:23 467:5 469:21 470:1,13	scanned-records 505:3 scanning 505:1,14,21 505:23 scans 489:10 493:20 schedule 425:6 430:24 514:21,23 518:5 519:4,5,12 520:18 521:12,12,19,19,21 522:6,19,22 529:8 529:10,16,20 581:8 602:24 603:13,20 605:2 608:17,18 609:6 610:3 scheduled 394:2 602:18 604:9,18 schedules 393:19 496:20 515:4 516:3 516:7,10 517:7 518:4 520:2 521:7 521:18 522:18 523:23 scheduling 621:15 school 567:2,13 scope 462:6 477:2,3 477:10 479:3 535:16 screen 491:12,16 se 466:18 656:9 search 418:21 season 446:24 447:5 447:15 second 427:22 445:8 461:11 479:18 484:1 504:12 535:18 537:3 548:19 553:4 583:5 585:21,24 595:11 598:9,20 621:14 631:18 640:21 650:4 650:7 section 393:8 484:17 486:5 585:13 639:21 see 403:17 418:1 422:2 431:19 432:18 436:7 439:12 447:20 453:4 454:5,14 459:23 478:21 479:1 483:19 501:21,22 504:13 514:12 515:3 517:23 519:13	sees 603:11 633:12 661:6 seen 397:10 472:21 557:14 559:6 608:23 627:2 628:1 634:8 Segal 392:18 segment 475:5 select 400:15 639:20 639:20 selected 467:19 selection 525:12 self-healing 656:6,8 send 504:16 sense 521:13,15 524:6 525:9 542:24 544:21 634:18 652:8 658:11 sent 395:4 489:1 490:19 527:11 sentence 436:8 631:19 636:13 separate 542:5 619:21 separately 457:1 598:3 serve 596:17 599:21 634:1 647:13 served 422:18 427:13 server 411:15 service 393:10 395:4 399:17 400:10 407:10 416:20 428:3 433:15,21 434:23 435:5 437:11 439:19 443:24 448:2 454:18 460:17 461:21,22,24 462:1 464:1 465:9 465:16 466:23 467:5 469:21 470:1,13	side 621:15 657:5 sign 659:5 signal 664:5,10 signed 602:3 significant 424:4,5 440:24 445:10 449:8 476:5 481:14 513:17 513:20 565:12 596:6 631:22 648:11 651:6 significantly 441:3,13 442:12 666:17 similar 531:3 544:12 564:9 588:14 589:13 591:7 612:18 622:7 649:10 652:2 service-company 615:13,16 services 429:10 439:9 439:18 443:16 445:18 446:11 453:16 462:24 463:3 463:5,9,19 464:10 469:17,19,20 470:11 485:21,22 490:6,9 491:10 548:6 595:16 600:3 636:4 663:15 serving 668:22 sessions 435:13,16 set 496:19 516:3,6 528:17 614:19 settled 562:19 settlement 611:10,17 611:21,22 612:7,9 settlements 498:17 seven 410:1 436:10 453:7 500:13 535:14 640:5 seven-day 486:23 severity 485:24 shape 647:16 share 644:24 sheet 518:23 520:4,9 523:17 546:8 sheets 520:19 shift 649:4 shifts 483:6 484:11,12 short 580:8 614:6 625:5 630:18 shorten 633:1 show 501:8 518:7,9 521:7 531:14 657:14 showed 585:9 showing 393:21 shown 604:10 632:24 shows 522:19 530:21 531:1 571:9 627:9 629:3
S	schedule 425:6 430:24 514:21,23 518:5 519:4,5,12 520:18 521:12,12,19,19,21 522:6,19,22 529:8 529:10,16,20 581:8 602:24 603:13,20 605:2 608:17,18 609:6 610:3 scheduled 394:2 602:18 604:9,18 schedules 393:19 496:20 515:4 516:3 516:7,10 517:7 518:4 520:2 521:7 521:18 522:18 523:23 scheduling 621:15 school 567:2,13 scope 462:6 477:2,3 477:10 479:3 535:16 screen 491:12,16 se 466:18 656:9 search 418:21 season 446:24 447:5 447:15 second 427:22 445:8 461:11 479:18 484:1 504:12 535:18 537:3 548:19 553:4 583:5 585:21,24 595:11 598:9,20 621:14 631:18 640:21 650:4 650:7 section 393:8 484:17 486:5 585:13 639:21 see 403:17 418:1 422:2 431:19 432:18 436:7 439:12 447:20 453:4 454:5,14 459:23 478:21 479:1 483:19 501:21,22 504:13 514:12 515:3 517:23 519:13	sees 603:11 633:12 661:6 seen 397:10 472:21 557:14 559:6 608:23 627:2 628:1 634:8 Segal 392:18 segment 475:5 select 400:15 639:20 639:20 selected 467:19 selection 525:12 self-healing 656:6,8 send 504:16 sense 521:13,15 524:6 525:9 542:24 544:21 634:18 652:8 658:11 sent 395:4 489:1 490:19 527:11 sentence 436:8 631:19 636:13 separate 542:5 619:21 separately 457:1 598:3 serve 596:17 599:21 634:1 647:13 served 422:18 427:13 server 411:15 service 393:10 395:4 399:17 400:10 407:10 416:20 428:3 433:15,21 434:23 435:5 437:11 439:19 443:24 448:2 454:18 460:17 461:21,22,24 462:1 464:1 465:9 465:16 466:23 467:5 469:21 470:1,13	side 621:15 657:5 sign 659:5 signal 664:5,10 signed 602:3 significant 424:4,5 440:24 445:10 449:8 476:5 481:14 513:17 513:20 565:12 596:6 631:22 648:11 651:6 significantly 441:3,13 442:12 666:17 similar 531:3 544:12 564:9 588:14 589:13 591:7 612:18 622:7 649:10 652:2 service-company 615:13,16 services 429:10 439:9 439:18 443:16 445:18 446:11 453:16 462:24 463:3 463:5,9,19 464:10 469:17,19,20 470:11 485:21,22 490:6,9 491:10 548:6 595:16 600:3 636:4 663:15 serving 668:22 sessions 435:13,16 set 496:19 516:3,6 528:17 614:19 settled 562:19 settlement 611:10,17 611:21,22 612:7,9 settlements 498:17 seven 410:1 436:10 453:7 500:13 535:14 640:5 seven-day 486:23 severity 485:24 shape 647:16 share 644:24 sheet 518:23 520:4,9 523:17 546:8 sheets 520:19 shift 649:4 shifts 483:6 484:11,12 short 580:8 614:6 625:5 630:18 shorten 633:1 show 501:8 518:7,9 521:7 531:14 657:14 showed 585:9 showing 393:21 shown 604:10 632:24 shows 522:19 530:21 531:1 571:9 627:9 629:3		

smartphone 627:13 smartphones 663:23 smell 582:4 Smith 395:13,13,15 395:24 396:2,7,11 397:9,13,16,19 398:1 401:11,12,14 401:17,21 402:1,4,7 403:15 404:8,15,19 404:23 405:3 406:5 406:8,14,22 407:2,5 407:12,16,19,22 408:17,20 409:17,23 410:2,13 411:10,18 412:20,24 413:6,13 413:21 414:12 415:14,20 416:1,5 416:16,21 417:3,6 417:15 420:1,16,22 421:9,19,24 422:4,8 422:12,20 423:1,6 423:13 424:1,13,18 425:4,14 426:4,13 426:21 427:15,17 428:1,9,18 429:20 430:9,13 431:11,13 431:15,21,23 432:2 432:7,11,15,21 433:4,8,12,19,22 434:3,6,19 435:2,7 435:20,24 436:13,17 437:3,17,19 438:3 438:11,20 439:10 441:9 445:12,19 446:23 447:1,8,19 448:4,9,18 449:5,10 449:14 450:10,14 451:13,20 452:12,16 452:21 453:5,9,18 454:1,6,12,19 455:16 456:3,11 458:3,19 459:1,17 460:5 462:10,15,21 463:2,7,12,15,20 464:3 467:10 469:24 470:5,9,14 472:15 473:3,12,16,23 474:7,14 476:23 477:12,18 478:6 480:1 483:15 489:12 489:16 490:22 491:2 491:7,13,17,24 492:9,14,18 493:2 493:11,21 494:3,12 494:15,22 495:1,7 495:13 497:18	498:15,19 499:9,15 499:21 500:1,5,15 501:2 502:3,7,9,13 502:17 503:5,20 505:15 635:21 653:24 675:4 software 488:23 489:4 493:18 595:15 596:14 597:7,14,24 598:18,23 600:5 624:7 641:10,12 643:1,2,3,5,17,19,20 643:24 644:4 646:5 647:1,2 661:14 solicitation 516:18 solid 472:14 501:9 502:1 solution 524:14 565:6 573:15 582:5 585:3 586:4 587:15 588:21 589:16 590:7,24 596:5 598:24 599:1 599:6,20 601:9 614:22,24 615:2 616:11 621:11,20,23 624:12 626:17,20 627:11 629:2 635:13 637:13,17 638:16 639:18 644:13 647:23 649:12 651:14 652:17 658:10 663:19 664:2 664:6,14,17 670:14 solution's 599:17 solutions 516:24 597:11 598:18 627:17,18 630:16 644:8,20 645:15,23 646:5 647:2 648:3 657:16 658:13 somebody 408:20 413:21 453:12 502:14,16,17 630:6 630:6 someone's 666:12 soon 400:14 470:16 471:22 504:23 512:15 528:10 SOP 573:7,19,24 574:9,19 sorry 394:5 401:4 408:3 410:18 415:15 421:5 452:1 476:21 481:19 485:15 500:23 532:18 546:1 549:9 550:11 574:6 575:11 618:13	659:24 662:15 sort 426:14 502:8 582:22 584:2 585:22 586:1,14 590:5 598:22 621:9 628:15 631:8,10 637:18 642:15 651:12 654:17 670:13 sought 605:22 sound 561:12 569:21 593:22 595:5 606:3 647:6 sounds 490:13 562:9 584:10 669:7 source 428:16 429:3 429:19 470:7 South 390:6 394:5 span 421:17 422:1 spans 420:17 speak 401:2,5 411:18 411:23 467:13 515:2 532:24 538:14 574:4 611:1 625:8 636:21 speaking 430:16 496:6 534:20 609:4 630:6 636:2 specialists 586:10 specific 402:5,14 404:23 409:19 410:6 410:9,21 412:21 413:13 417:24 418:5 418:11 420:23 423:14 424:13,21 425:6 430:13 433:16 438:12 447:21 448:4 448:9 449:10 489:18 493:14 502:15 512:4 527:19 535:2 565:18 566:14 596:22 617:21,23 638:2 652:4 specifically 402:3,17 403:19 404:1 406:14 406:16 410:3 413:22 420:4 430:16 449:23 454:13 455:18 457:15 458:7 522:19 578:24 581:7 595:24 597:1 648:21 658:20 speed 504:19 spell 479:17 spend 534:8 587:17 607:12 613:1 spending 418:2 607:9 653:2 spent 496:12 617:16	SPIPE 406:23 429:18 431:19 432:5,9,20 433:2 489:10 493:20 split 497:16 499:5 spoke 491:19 615:10 sponsor 431:11 sponsored 397:14,23 447:11 508:7 557:18 558:3 559:10,19 624:1 spot 433:24 434:13 465:15 spread 498:8 spreadsheet 568:2 staff 394:14 430:7 435:23 436:16 437:10 438:10,17 439:7 444:7,20,24 450:23 453:24 465:1 466:10 483:4 484:14 654:14 staffing 448:7 449:1 450:6,11,15 482:10 482:13,14,23 483:5 483:8 484:9 503:6 staffs 484:8 stage 603:10 604:1 stand 623:11 628:6 standard 403:13,15 403:22 404:2 427:19 428:3 482:9,12,14 standardizing 427:19 standards 465:1 standing 423:24 stands 534:16 623:10 start 401:7 441:18 543:12 555:14 556:3 560:8 584:14 590:5 603:4 622:13 625:15 657:20 663:14 started 411:5 419:5 457:3 463:15 535:3 667:2,8 starting 427:12 440:6 585:11 599:17 601:9 615:2 626:16 636:1 636:12 645:9 654:5 658:1 starts 631:19 654:12 657:23 state 395:12 407:13 426:22 435:12,15 472:13 480:8,23 506:15,19 532:3 549:5 555:17 619:9 stated 421:9 448:6 478:2	statement 419:2 471:20 546:8 636:18 statements 544:18 545:4 states 435:10 563:20 606:23 stating 568:7 Station 390:6 statistical 537:7 statistics 426:10 454:16 455:4,8,22 status 517:2 654:14 stay 544:6 staying 616:5 steel 471:14 Steelworker 484:13 steelworkers 392:24 430:17 462:13 484:19 486:22 625:7 steering 539:19 step 535:15,18 631:22 632:14 633:6 steps 535:14 stood 530:17 stopping 450:19 story 656:21 straight 496:23 straight-time 496:21 stranded 472:24 473:8,11,14 474:5 474:10,13,20 strategic 596:6 650:22 strategies 566:8 strategizing 565:24 strategy 587:13 stream 595:9,10,14,19 596:13 streams 596:12,19 622:8,12 street 391:6 423:24 443:9 455:2 475:1 475:15 476:20 477:21 478:10 479:21 489:1 490:21 583:15,16 657:5 street-level 409:13 654:15 strike 415:12 420:11 422:17 426:10 429:12 445:7 455:11 465:12 588:3 660:9 strong 605:4 struck 476:3 structure 485:3 structured 442:7 445:1,2
---	---	---	--	--

<p>students 443:21 444:3 444:4 studies 535:23 536:8 536:11,16 537:6 540:23 541:20 549:17 Studley 478:15 479:15,20 480:14 Studley's 479:1 study 394:10 525:2,18 534:7,12 535:1,17 535:18,20 536:3,4 536:10 537:2,8 538:23 539:9,12 540:3,7,21,24 541:3 541:6,10,15 542:3,6 542:15,18 543:14,20 544:4,7 545:16,23 547:10,13 549:19 550:6 552:7 553:6 554:1,14 subject 401:19,21 404:17,19 422:16 449:7 451:15,20 463:10 464:5 469:9 469:13 482:1,4 486:4,8,19 519:10 612:10,24 653:23 submit 495:18 submitted 396:14,22 500:17 501:1 507:21 556:16 557:1 561:11 561:15,19,24 562:10 562:11,16 564:11 606:5,6 609:15 submitting 504:10 659:10 subscribing 643:16,20 subscription 643:14 subsequent 600:7,11 600:20 subsystems 568:1,8 568:16 569:5,13 577:22 587:24 593:11 success 561:3 602:1,5 627:2 656:21 successful 602:9 626:23 639:1 successfully 587:14 603:1 suddenly 647:7 suggest 603:12 suggested 530:2,4 suggesting 609:1 suggestions 666:20</p>	<p>suited 409:18 429:7 461:18 536:6 summarize 565:10 567:23 568:4 598:2 614:9 641:9 summary 517:9,13,18 517:19 518:15 520:3 521:18 522:1,12 606:11 supervise 420:15 supervision 396:19 397:3,18 398:19 465:19 466:12,14 508:3 533:7 556:22 557:7,22 558:23 559:14 supervisor 420:14,21 421:8,12 422:19 425:22 426:2,6 466:17 480:22 495:18 496:2 497:5 504:8 636:16 supervisor's 637:24 supervisors 420:7,19 421:16 426:6,11,19 444:21 466:10,16 628:3 637:4 659:5 supplement 562:3 supplemental 507:20 507:24 510:12 533:2 533:11 563:1,4 Supplemental-1 512:24 supplies 548:16 Supply 623:4 support 418:9 459:6 532:18,19 536:2 543:3 547:24 587:14 620:16 622:12 624:18 637:21,24 638:12,13 639:21 640:12,15 646:10 668:17 support-capital-rel... 543:4 supported 412:4 417:8 418:24 419:9 647:24 668:12 supporting 538:11 586:24 597:14 620:15 621:20 622:16,20 623:4 635:17 supports 580:8 supposed 514:15,22 515:11 640:22 657:12 659:19</p>	<p>sure 400:20,23 401:21 411:18 413:14,21 414:6,10 425:7 427:17 428:7,9 440:9 448:18 451:20 454:12 461:6 466:7 481:9 484:9 489:16 493:14 494:15,22 504:21 513:24 514:1 519:24 520:15 521:10,17 522:15 523:15 525:15 537:21 540:15 544:21 545:1 550:21 554:11,12 562:9 566:8,16 602:24 607:13,14 609:8,10 612:24 616:19 618:21 619:7 623:17 623:24 625:10 626:12,13,19 628:8 636:6 662:18 664:23 668:17,19 surface 476:4 surrebuttal 528:24 529:1,20 530:1 survey 653:4,5 sustainable 442:8 sustaining 648:23 sustainment 565:5 648:14 SVP 556:7 560:13 switch 506:11 531:23 sworn 395:16 451:7 506:15,18 507:2,6 532:7 533:18 555:22 613:22 662:22 Sylvan 391:17 synopsis 481:7 system 403:14 404:12 404:16 408:21,24 409:15 413:10,17 414:15 417:10,13 428:13,16,20 429:2 434:12 448:14 451:14,16,18 482:19 488:3,5,8,19 489:10 489:17 490:1,2,5,7 490:17,20,24 491:5 491:8 492:23 493:19 494:21 495:5 496:19 497:3,22 498:10,13 501:4 502:2 505:3,6 544:3 570:15 589:20 594:13 595:20 616:3 624:9 626:6 628:23 628:24 629:14,17</p>	<p>631:1 632:6 640:8 641:24 642:1,8,9,21 653:8,10 654:23 655:3,4,4,10 656:23 657:5 667:20 systems 406:18,20 411:19,20,24 413:15 413:16 419:7 424:11 427:19 429:24 430:4 432:3,17 451:12 456:4 488:11 489:12 493:15,20 494:13 568:1,2,8,12,16 569:5,12,19,20 570:17 573:14,16,17 573:20 574:20 577:21 578:8 579:7 580:5,21 582:8 587:23 588:19 593:11 594:18 595:4 596:1 599:16 602:20 615:12 625:20,20 626:4 628:9 631:21 631:21 633:23 635:1 635:5 637:1,9 641:2 642:6,15,18 646:8 647:3,19 650:24 654:9 655:12,13 656:11,12 666:21,23 667:6,10,10,16,22 668:7,9,11,15,18,21 669:2,19 671:16</p>	<p>610:10 613:20 674:4 takes 501:18 633:7 634:15 665:3 talk 399:14 406:6 429:9 440:24 445:6 445:10,14 446:23 456:14 491:3 514:2 554:5 565:2 594:16 599:22 625:11 628:17 638:9 642:3 642:15,19 643:2 656:7 talked 527:16 589:18 602:16 623:7 630:15 632:10 639:15,22 641:16,18 648:6,17 659:2 665:13 talking 400:1,2 406:7 406:16 411:15,15 421:3 427:22 429:11 429:17 432:1 435:21 435:22 441:21 453:7 461:8 470:3 485:9 486:9 520:17 571:23 593:10,16 597:15 602:7 636:7 639:3 641:24 649:7,9,13 654:17 664:19 668:19 talks 489:9 633:5 tape 665:2 tariff 513:22 tariffs 510:24 511:1,5 511:6 task 495:20 498:7 tasked 494:19 tasks 498:9 tax 507:15 509:9,18 510:4 516:20,20 517:1,1,24 518:11 524:11,18,20,22 525:2,3 528:22 529:1 530:4,7,10,11 530:14,14,18 531:1 551:23 614:7,7,10 taxable 526:7 taxation 515:19 taxes 513:3 525:10 526:11 530:19 531:7 team 464:6 539:18 544:21 561:24 565:21 566:7 580:10 610:10 617:3 622:14 639:13,17 640:7,11 642:4 656:22 teams 646:10 668:13</p>
T				
<p>table 433:13 617:21 618:11,16,24 620:2 620:7,10 650:2 658:17 tables 650:2 tactics 566:8 take 403:3 450:18,20 500:8 502:1,19,22 503:9 524:13,16 526:3 544:22 555:13 567:19 568:22 569:9 571:19 575:8 588:4 598:7 600:14 603:3 604:17 605:11 613:18 616:22 617:15 632:5 633:21 634:3 651:14 658:1 taken 414:4 415:9 425:11 439:8,12,16 439:17 451:4 467:24 469:1 486:12 501:2 502:15 526:7 555:15</p>				

<p>tech 628:19,20 630:9 tech-savvy 627:21 technical 441:1 614:23 623:6 639:11 technician 471:22 technicians 406:20 411:24 413:1 421:17 471:9 663:1 technologies 406:24 643:10,10 654:9 technology 401:8,13 401:22 402:17 404:14 408:23 409:12 412:3,3,10 412:14,17 417:7,8 419:7,8 423:12 424:24 425:2,3 428:13 434:22 442:7 630:1,21 632:18 633:23 657:16 techs 419:11 teething 637:18 telecom 419:16 telecommunications 412:5,10,14 413:6 417:9,14,21 418:8 491:9 493:7,12,15 tell 400:7 408:2 418:13 425:4 427:16 429:9 438:9 454:8,8 457:7,15 458:23 462:16 468:21,24 489:14 501:20,21 548:20 549:9 650:20 temperature 483:18 templates 535:19,21 537:15 540:8 ten 612:23 ten-minute 555:13 ten-year 610:14 term 416:14 598:13 630:11 635:6 terminal 425:17 terminals 412:2 423:19 432:3,16 terms 420:17 455:19 504:3 517:2 519:1 561:19 570:6 584:1 585:5 586:18,24 590:13 600:4 608:4 613:5 627:14 637:12 644:5 647:17 664:19 671:3 territories 427:20 428:4 470:13 territory 399:17 400:10 402:16</p>	<p>404:22 416:18 420:14 422:17,18 430:17 433:21 436:12 437:11 439:19 443:24 454:18 460:17 461:21 462:1 469:21 472:7 test 416:12 425:12 426:18 427:2,4,6 437:13 450:4 452:10 456:18,24 457:19 458:7,8,9,11,16,18 458:21 460:17 598:24 626:18 627:1 tested 602:4 628:9 testified 395:18 414:13 455:17 464:23 507:4 532:9 533:20 555:24 565:3 669:17 testify 395:16 507:2 532:7 533:18 555:22 560:9 563:23 566:12 testimony 396:12,17 396:21,24 397:7,8 398:13,17,23 399:13 401:6,10 405:23 406:4 409:11 411:23 415:17 427:12 431:22 435:7,9 437:24 440:3 444:8 445:6,10 446:22 447:10 448:14 450:8 451:9,22 453:1,14 454:3,6 455:15,16 458:17 459:5 460:8 460:9 470:18 471:1 473:2 474:24 477:1 478:2,7,19 484:7 487:7 489:9 490:16 492:3 493:9 498:18 500:10 502:4 507:20 507:24 508:7 509:24 510:8 512:3 528:21 528:23 529:21 530:1 533:2,11 539:7 540:24 547:15 550:20 554:23 556:15,20 557:1,4 557:11,12 558:17,19 559:3,4 561:6,9,15 561:20 562:2,5,11 564:10,16,20,22 565:4 567:19,21,23 606:9 607:10,14,16 608:11,14 609:19</p>	<p>621:1 625:16,17 635:19,20,24 638:6 653:24 657:14 662:2 662:24 663:4,9 669:8 673:10,11 testing 472:18 474:9 617:14 629:10,12 text 407:17 408:8 thank 395:9,21 398:2 399:3 401:1 404:9 419:17 422:11,22 424:15 425:9 427:7 433:17,23 434:20 438:22 443:10 444:6 444:15 445:5 446:22 449:6,17 450:5,17 451:8,21 452:8,9 463:12,23 464:23 466:9 469:15 470:12 470:24 475:21 480:15 485:13 487:20 505:7 506:8 506:10 508:10 509:4 517:23 527:2 531:23 532:12 533:15 541:6 555:8 558:5 559:22 560:1 562:20 563:7 565:2,18 566:20 567:18 568:24 570:11 572:22 575:7 577:5 578:16,21 579:5 580:14 582:10 585:5,20 587:16 589:22 590:15 592:17 601:19 602:6 609:24 611:3 615:4 615:6,21 622:7 624:20,23 636:10 669:13 672:16,20 673:12 Thanks 451:2 564:19 574:7 theory 637:19 thereto 471:8 thing 418:12 457:6 611:13 613:7 642:4 647:13 655:21 658:13 661:12 664:1 things 418:16 445:15 451:24 503:2 539:23 561:15 602:24 604:13 623:17 632:12 635:21 637:8 638:4 642:2 649:13 651:3,4 654:3 656:17 666:14</p>	<p>think 394:18,21 417:23 418:15 420:22 421:3 438:23 456:11 470:3 479:10 488:7 502:20 511:21 515:5,7 520:23 524:1 525:5,8 528:7 529:10 549:15 550:3 550:4 555:7 566:14 573:12 588:23 590:12 593:7 598:9 601:8 604:1,8 605:24 612:20 613:4 613:7 617:3,6,21 619:24 620:1 624:1 624:11,18 627:6 628:1 630:11 632:23 635:19 636:7,19 637:7 638:21 639:21 640:22 642:1 644:15 646:18 650:23 655:2 655:20 656:13 658:10 660:19 662:13 665:4 669:11 670:8,19,21 thinking 649:1 third 540:19 586:1 621:16,24 623:15 650:14 662:11 third-party 476:12 thought 523:7 648:6 thousand 469:11 three 487:6,11 524:16 535:24 542:5 548:1 584:2 585:22 601:22 621:6 622:12 623:23 626:24 631:19 644:7 644:22 three-to-five-year 441:2,12 442:12 444:9 threshold 527:19 Thrift 551:19 Thursday 390:7 ticket 406:3 408:9 477:4,6,11,13 490:17 tickets 431:17 432:18 480:21 tied 418:5 431:19 432:9 597:13 614:7 614:19 615:1 621:16 621:23 Tim 560:5 time 397:8,20 398:23 409:21,21 412:11,11 412:24,24 416:10,19</p>	<p>418:2 423:7 424:16 424:20 436:10,11 437:12 453:11 455:9 463:18 464:14 466:20 486:19 495:8 495:11,15,17 496:12 496:13,24 497:22 498:8 501:3 504:22 504:23 508:5 511:9 513:21 517:2 522:3 524:24 525:4 528:23 533:9,11 534:7,8,12 535:20,23 536:3,7 536:10,16 537:2,6 540:7,21,22 541:3 541:10,15,20 542:3 542:6,9 543:14 544:4,7 549:13 554:3,6,13 557:12 557:24 559:1,16 561:21 563:8 567:9 567:13 570:6 583:19 584:22 587:17 592:4 592:18 599:9 607:9 607:12 610:12,15 614:17 624:22 626:14 633:7,7 634:4,6,7,18 641:3,3 647:10 648:8 650:13 650:17 652:11,21 653:19 655:5 656:4 658:21 659:1,6,10 659:19 661:11 664:13 673:4 timeline 425:1 501:17 598:11 602:19 timelines 604:20 times 402:21 405:17 410:5 413:2 426:11 426:19 438:12,13,16 446:12 502:4 665:1 672:5 timesheet 479:9,12 480:12 timesheets 478:8,13 478:20,24 479:6 480:8,14,17 659:5,7 659:10,17,18,21 Timothy 392:5 timothy.reppucci@... 392:15 title 451:11 560:12 564:1 today 403:2 406:11 407:20 409:18 428:24 430:5 438:1 453:14 457:17</p>
---	---	---	--	---

460:14 464:17 478:20 493:13 502:18 504:2 524:12 560:7 566:12 579:16 579:17 583:24 610:19 633:5 634:1 634:18 638:10 645:20 646:7 655:3 655:15 657:18 659:2 661:6 663:21 664:16 664:24 666:10,16 667:20 668:3,11 672:11 today's 467:6 told 474:8 tomorrow 524:13 tool 622:6 637:5 656:15 664:4 tools 406:17 446:16 446:16 627:15,16 628:4,16 634:11 top 522:5 543:20 551:8 577:3 622:13 625:17 topic 434:4 torquing 472:21 total 448:21 458:10 489:11 515:16 553:8 553:9 595:12 606:16 607:3 610:18 611:23 612:14 616:6,7,8,13 616:14,19,20 617:12 617:15,18 618:7,20 619:7,21 totals 609:8 touch 629:5 630:1 Toughbook 412:1 491:18 671:16 672:6 672:11 Toughbooks 415:19 417:19 419:21 420:2 423:12 424:17 425:13 430:5 491:21 493:8 657:17 663:1 663:5 towers 491:5,8 town 469:14 trace 471:10 tracer 470:18 471:1,2 471:13,15,16,23 472:8 track 433:4,14,16 447:20,23 453:22 495:7,17 598:3 605:3,4 622:15 623:18	tracked 457:1,4 498:12 trackers 545:22 tracking 456:16 497:7 tracks 426:22 495:4 495:15 traditional 455:24 670:13 traditionally 598:19 train 438:3 454:4 626:15 trained 420:3,6 425:20 training 400:22 402:2 402:5,12,15,19,22 403:6 404:20,24 405:2,13,14,17,18 405:18 435:5,8,13 435:16 436:2,6 438:2,5,12,16,18,18 439:5,11,16 440:3 440:10,12,18 441:1 441:3,13 442:8,9,13 443:14,20 444:17,19 444:22 445:2,4 457:10,11,12 465:4 465:6 535:24 623:6 625:19,23 626:4,10 626:13,16,18 627:7 627:14 628:15 630:3 631:9 632:9 633:10 633:10,12,18 634:7 634:9,10,19,22,24 635:1,3,7,8,14 637:19 639:14 640:1 648:2,11,13 649:6 658:6 trainings 438:9 443:11 444:15 629:16 transcript 405:11 410:20 623:21 674:5 transferred 440:5 transmit 492:23 transmitted 666:22 transported 655:18 transposed 519:16 travel 394:5 650:12 650:13,16,17 652:11 652:11 653:19 traveled 487:2 travels 394:7 treatment 395:2 510:22 605:22 trench 501:21,23 triangle 585:16	tried 444:3 trouble 485:8 549:14 truck 491:12 495:24 583:14,16 630:7,10 trucks 423:20 432:4 432:16 490:21 true 449:7 480:7 486:11 527:18 547:2 561:4 573:19 579:16 579:17 581:18 613:5 622:18 669:9 674:5 trued 513:7 612:24 truly 540:3 trust 653:13 truth 395:17,17,17 507:3,3,3 532:8,8,8 533:19,19,19 555:23 555:23,23 try 421:11 427:15 456:13 467:14 542:24 625:5 632:20 trying 418:2 419:23 517:4 522:23 571:5 650:23 Tuesday 487:14 Tufts 506:17,21,21,24 507:10 508:11,13,18 508:21 509:1 511:2 511:7 513:14,24 518:16 675:9 turn 435:11 458:4 470:16 502:1 516:13 517:13,17 518:3 538:5 570:11 571:8 576:8 577:21 578:2 580:14,15,23 587:16 587:20 589:24 601:11,13 605:19 606:20 607:6 608:8 611:6 613:8,12 615:24 620:24 624:6 631:14 640:16 653:24 658:16 turned 504:8 turning 401:6 402:23 445:5,9 568:24 580:6,7 591:13 625:15 649:24 turns 657:6 two 398:9 451:11,13 469:11 483:23 504:6 507:6 516:23,23 518:13 519:21 520:23 522:11 523:24 552:18 556:10 558:12 567:7 582:8 583:3 596:18	597:14 598:19 602:8 612:15 614:12 621:12 622:18 638:13 642:18 643:9 649:13 650:9 Tyler 390:19 type 433:14 436:3,5 457:12 464:12 479:7 489:19,20 497:21,22 498:4,5 499:2,15,16 547:21 594:10 607:15 types 497:19 498:20 498:24 499:12 548:17,17 549:2 565:18 583:8,9 585:3 594:11,13,17 594:20 651:10 typically 410:4 470:10 typo 608:16 <hr/> U U.S 541:7 563:16,18 568:3,17 569:6 621:12 624:11 651:11 Uh-huh 641:20 650:19 654:11,16 665:15 UK 563:15 ultimately 457:8 561:2 583:23 586:22 599:13 615:15 unable 420:1 445:7 595:23 596:13 612:13 636:13 638:8 unavailability 410:6 uncollectible 520:8 521:3 uncollectibles 518:24 uncomfortable 635:13 uncover 481:13 underlying 660:19 underneath 471:10 underrecovery 513:15 understand 404:6,11 405:6 406:15 408:11 414:11 416:21 418:24 424:23 426:21 428:7,9,12 434:17 437:15 440:21 454:12 479:23 480:1 494:22 515:8 566:15 588:19	589:5 600:24 618:8 629:22 645:13 656:19 understanding 407:7 421:11 429:23 431:4 455:7 472:10 473:3 475:17,20 493:3 494:6 500:22 517:8 539:24 546:16 629:23 636:24 647:17 654:1 Understood 428:18 625:13 unduly 607:16 unfilled 400:5 460:4 unforeseen 603:7 604:23 605:10 union 392:24 399:3,20 403:23 408:22 431:5 431:8 447:3 459:6 486:12,18 503:2 624:23 628:2 667:3 671:22 673:1,8 unionized 484:14,21 unit 400:14 445:3 468:4 United 563:20 units 412:15 unnecessary 646:1 unprotected 526:9 531:18 unrelated 671:12 unsupported 417:13 417:20 418:14 419:13,16 untimely 453:23 UNY 585:16,18 up-to-date 493:5,6 update 428:22 505:10 562:3,21 619:1 643:23 644:3,4 645:17 670:17 updated 412:14 429:6 430:2 488:20 501:4 501:17 538:22 609:20 633:23 648:3 656:3 666:24 updates 447:4,14 505:14,21,23,23 641:12 644:7,16 645:19 646:4 647:21 668:18 669:20 updating 445:11 494:19 620:19 upfront 552:18 596:7 598:24
--	--	---	---	--

upgrade 624:8,16	USW-18 467:8,11	valve 489:20	W	514:7 520:22 523:20
upgrades 644:6 645:6 668:14	677:3	van 417:20 491:12	W 392:1	523:24 539:4 544:3
upload 407:14 408:7	USW-19 468:9,10	vans 417:2 419:3	wages 551:5,8	555:14 563:3,7
uploading 429:2	677:4	422:23 423:5,12,23	Wagner 390:19 391:4	583:19 590:12 602:7
upper 502:8,9	USW-2 404:6,10	425:2 490:21 494:2	512:22 675:13	603:12 609:7,11
upskill 435:17 438:2	677:5	494:3	wait 524:19	610:1 613:19 617:3
upstate 585:18 600:21 629:9	USW-20 474:1,2	varies 421:10 470:9	wake 644:21	642:2 645:9,18
upticks 447:15,17	677:6	498:4	walk 495:2 529:16	646:1 659:15 668:1
USA 507:14 532:17	USW-21 474:22,23	variety 459:1,7	571:4 621:9	we're 394:18 417:24
541:4 556:6 558:7	677:7	various 495:18 507:21	walked 554:22	418:3,10 421:3
usable 488:24 489:5	USW-22 477:24 478:1	535:9,12,22	Waltham 391:18	422:5,12 424:24
493:19	677:8	vary 420:16,18 425:6	443:9 627:20	428:17 430:6,16
use 403:23 404:1	USW-23 479:23	vast 436:11	want 394:22 402:18	441:17 449:23 470:3
408:23 409:3 416:14	480:17,18 677:9	vehicle 491:16	410:19,20 414:6,10	472:15 480:19 481:4
418:21 429:24 430:2	USW-24 484:5,6	vehicles 412:2 416:18	415:1 427:5,11	511:14 512:1 515:8
444:19 471:9,23	677:10	424:12 491:1 492:17	431:11 442:11	516:22 518:22
473:11,14 474:12,20	USW-25 503:18,19	vendor 413:9 414:3	459:12 470:16 480:3	520:16 521:17
483:5 485:4 491:9	677:11	414:24 415:8 452:19	502:19 504:1 520:15	523:16 528:7,8,8,17
494:9 542:20 543:23	USW-26 506:2,3	468:18 524:12	523:15 527:4 561:5	531:8 566:6 571:4,5
544:3 590:5 602:1	677:12	534:13,21 540:5	562:8,24 575:15	571:22 580:17
626:20 628:4,9,22	USW-3 405:21,22	vendors 413:15 417:9	595:14 598:2 607:11	585:10 587:23 588:2
629:17 634:11 635:5	677:13	417:14,21 418:8	607:12 608:3 609:13	589:24 590:6 593:16
637:5,17 647:10	USW-4 408:11,13	419:16 491:9 494:24	620:18 632:15	593:17 596:13
651:15 653:13 658:8	677:14	516:23 548:8 596:8	636:21 638:11	603:11,15 605:3
658:15 663:13	USW-4-37 433:7	614:13	645:24 664:21	611:5 612:13 615:19
usefulness 423:11,19	USW-4-41 415:14	verified 486:1	670:14 671:7	623:17 624:15 627:7
useless 596:17	431:10	verify 545:11	wanted 394:12 395:2	636:6,19 645:10
user 453:10 648:10,10	USW-5 409:9,10	verifying 536:12	399:12 529:15	647:6,16 651:3
648:22	677:15	version 515:6,7,10,23	561:18 565:2 613:12	652:14 655:8,10,19
users 599:8 625:19	USW-6 411:12,13	522:14 590:4 624:14	664:23 672:22	657:6,15 658:8,10
640:9,10	677:16	624:16 670:17	warrant 483:5	658:11,12,13 660:22
uses 471:2 472:7	USW-7 415:10,11	versions 395:6 624:12	warranty 474:4,11,18	663:20 664:6 668:19
USOA 549:21	677:17	versus 433:15 455:24	wasn't 402:20 464:13	669:3
Usually 625:13	USW-8 416:23,24	468:7 496:24 525:13	476:21 481:18	we've 399:9 411:21,22
USW 403:8	677:18	531:17 597:23,24,24	539:22 542:8 545:8	412:16 422:4 430:17
USW-1 403:11,12	USW-9 419:19,20	613:6	547:7 655:24	443:12 447:11 448:6
676:17	677:19	very-high-level	waterfall 598:20,21	456:23 459:23 502:3
USW-10 427:9,10	utilities 390:3,6	548:23	waterproof 472:8	503:9 504:20 530:13
676:18	540:13,16 586:4	viable 598:14 599:5	wave 457:2	561:24 574:19,21
USW-11 434:17,21	651:11	599:22 600:6,12,16	waves 535:24 542:5	590:3 593:10 596:12
676:19	utility 549:22	601:1,24	way 415:16 425:23	596:20 597:8 602:16
USW-12 437:21,22	utilization 631:24	vice 396:3 398:6 558:8	447:12 481:2 521:12	604:4,6 605:4 607:9
676:20	utilize 428:12 584:19	564:1 566:4	566:9,18 574:1	612:21 613:6 615:3
USW-13 439:3,4	632:7	view 562:24	597:9 606:3 608:23	624:14 627:8,9,12
676:21	utilized 408:15 573:18	Viewer 660:15	612:20 630:8 634:2	627:19 628:1 629:7
USW-14 439:21,22	V	viewing 395:8	636:23 642:14 646:2	629:15 635:9,10,14
676:22	vacancies 455:9	violation 525:16,20,24	648:11 649:16	637:13 642:5,21
USW-15 440:20,23	461:10	526:2 527:17 528:3	652:18 657:6 666:9	645:20 646:13
676:23	vacant 456:6,9	virtue 552:13	ways 565:6 598:19	656:16,17,20 657:1
USW-16 441:23,24	vacated 455:23	visibility 583:12,16	635:16 642:22	658:9 672:4
442:11,15,16 676:24	valuable 645:23	604:4 645:1,19	648:20	weather 482:15,16,18
677:1	value 424:22 516:1	visible 586:7	Waze 653:13	482:24 483:8
USW-17 461:15,16	526:19 545:16 546:6	visitors 627:19	we'll 403:3,10 422:14	Wednesday 393:19
677:2	623:13 647:12 670:2	VOLUME 390:1	422:14 431:2 438:20	516:8
	670:20,21	volumes 483:2	439:24 452:7 453:21	week 410:1,11,22
		vouch 628:6	461:4 480:16 502:20	453:7,7,8 466:4
				499:18 506:18 527:3

603:18,19 628:5	413:14 417:11 419:4	496:17 497:13	yard 421:10,10	02110-3113 391:7
weekend 481:2 487:9	422:24 423:21,24	499:18,23 500:2	469:10 639:9	02111 392:21
487:17	425:24 427:21 428:5	539:17 542:22	yards 435:14,17	02451 391:18
weekly 410:24 411:1	428:24 436:4,5,12	563:10 566:1,2	637:15	
weeks 486:23 542:4,7	436:14,19,20,21,23	567:5,9 597:9	yeah 411:2 431:14	<hr/> 1 <hr/>
570:9 637:18 638:14	437:7,9 442:6	628:10 633:2	466:14 475:14	1 393:19 399:13 405:8
weighted 518:9	443:13 446:14,16	worker 475:21 499:16	494:14 496:8 565:13	413:11 451:19
went 477:10 500:12	450:15 456:22	665:17	566:19 570:10 585:1	510:15,17,20 514:9
546:2 547:6 596:8	457:13 459:7 462:23	workers 399:20	596:3 641:6 644:17	516:3,7,10 517:20
653:5	464:13 465:14,15,20	401:23 419:21 420:1	669:10	517:20 518:5,5
weren't 539:23	466:1 476:13 478:16	478:9 480:8 486:15	year 396:8 411:4,6	519:5,12 520:18
Werlin 391:5	479:1,7,10,11,13,14	492:20 499:12 552:1	416:12 425:12	522:8,8,9,9 523:23
Weymouth 475:1,16	480:4,20,24 484:14	653:15	426:18,18 427:2,4,6	533:3 538:6 571:11
477:21	486:20 487:8 488:4	workforce 436:15	433:3 437:13 450:4	578:2 608:9 610:3
whatsoever 664:11	488:8 489:16,20,21	484:21 592:18	451:17 452:10	618:6,15 621:3
whilst 573:14 597:17	492:12,17,21,24,24	629:24 630:24	455:14 456:18 457:1	625:17 649:20
Whitman 469:11,12	494:6,6 495:5,16	working 413:1 415:23	457:19 458:7,8,9,11	1,000 460:20
wifi 411:16 415:23	496:5,24 497:16,19	425:18 484:20,21	458:16,18,21 460:17	1.10(1) 607:18
417:10	497:21,22 498:2,2,5	486:5 496:13 497:8	460:23 469:21 470:9	1.10(2) 512:8
wild 418:17	498:7,11,16,19,20	515:24 522:2,20	470:10,11 483:20,21	1.3 530:6
window 660:20	498:24 499:1,2,7,9	523:4,18 540:5,9	484:3 535:4 542:8,9	1.4 616:17
wire 470:18 471:1,2	499:13,13,16,19,23	564:5 565:6 583:17	543:15 544:5 545:19	1/2 651:9 652:20
471:13,15,16,24	500:4 501:3,5,6,10	599:7 601:10,10,16	553:12 567:5 570:2	10 390:7 393:1 439:24
472:8 473:8,11,14	501:12,16,20 505:4	615:2 633:13 644:9	570:2 579:13 588:11	466:22 516:13,15
474:10,13,20	524:21,22 535:3	651:22 656:20,21	589:11,14 592:6	665:5 674:6
wireless 417:8 492:4,5	536:12 540:12	666:1 667:3	593:2 600:15 603:17	10.24 522:12
663:6	545:17 546:3 547:7	workpaper 538:5,7,15	603:23 604:9 605:8	10.44 522:4
wires 472:24	548:11 563:15 565:1	538:18	606:17 609:3 617:11	10.68 522:23,24
wish 397:6 398:22	566:6 578:20,23,24	workpapers 538:9,20	617:13 618:4 619:2	10:00 390:8 393:1
533:10 557:10	579:1 580:4,9 581:7	works 408:21 521:13	619:5,14 620:3,11	100 458:18 568:1,15
witness 395:11,13,14	582:4,6,15,16,17	563:6 599:2 600:13	620:13,19 644:7,22	616:19 619:7 640:5
404:8 408:12 411:10	583:7,8,9,12,16,23	601:12 622:12	657:21,24 658:2	104 436:9
421:24 434:19	584:15 585:3,4	649:17 664:2,7	year's 481:20 526:20	104.5 500:12
437:17 440:22	586:3,6,10 592:8	world 586:5 642:13	years 398:9 399:18	1058 457:23
448:20,24 449:5	594:10,11,12,17,20	666:17	400:6,7 431:5	107 545:17 546:2,5
450:24 462:10 466:7	595:9,10,14,19	worth 526:20	444:11 464:11 469:7	11 512:24 516:15
480:1 503:5,20	596:6,11,13,18	wouldn't 438:13	474:6 507:19 525:11	11,722 618:4,12,19
506:17,21,22,23	599:24 609:9 614:22	449:10 450:12 471:4	526:11,12,18 531:18	1100 671:18,19
516:9 520:22 523:20	614:24 621:6,11,12	528:6 543:23 553:18	556:10 558:12 567:7	117 568:22
524:7 529:19,24	621:14,15,21,21	584:23 636:21	570:4,5 603:4 604:7	12 440:2 525:8
532:5 533:13 534:17	622:8,12 623:2,2,4	672:12	604:14,18 610:17	12-to-18-month
554:19 555:10,13,18	627:23 628:24	wrap 469:15	612:23 632:5,10	584:21
555:19 574:6 575:9	629:13 630:8,18	writing 473:15	633:3 634:15 644:23	12003 392:24 395:1
575:18 578:23 606:4	632:6,23 637:9	written 473:21,22	645:15 647:20 665:5	399:22 400:10 447:3
619:9	642:11 645:5,8,20	503:13	yellow 585:15	484:19 486:23 625:7
witnesses 399:1	648:15 651:14 652:9	wrong 415:15 461:17	Yep 640:24	12003's 399:17 484:13
409:17 451:6 455:15	652:16,18 653:21	586:15 611:13	yesterday 562:2	13 440:2,24 484:17
506:6,10,14 509:2	654:15,22,24 655:3	656:18	York 561:7 562:8,12	486:5 549:12 657:10
528:18 531:22,23	655:9,11 659:8	www.fabreporters....	562:19 564:16	136 436:10 500:13
559:23 613:22	663:24 664:4,8,9,10	390:21	585:19,19 600:21,22	137 475:18
wonderful 538:1	664:12,14,18 665:3	Wyman 443:9	611:12 629:9,10	138 458:7,12,19,20
wondering 425:1	665:9,18 666:8			14 503:14 567:20
519:16 617:12	668:1,6 672:9,12,14	<hr/> X <hr/>	<hr/> Z <hr/>	143 537:6
word 414:9 671:15	workability 414:3	X 675:1	<hr/> 0 <hr/>	15 421:13 547:15
words 625:23 660:2	415:7	<hr/> Y <hr/>	02108 392:9	549:12 665:5
work 406:7,8 408:24	worked 413:9 480:10			15th 396:14 514:13
409:6,13 410:5	486:23 495:19			

556:17 16 451:22 453:1 503:15 549:5,11,15 164 393:8 16th 393:20 475:2 476:21 17-170 390:4 393:5 17E0238 562:12 17G0239 562:13 17th 476:22 477:22 478:15 479:2,20 480:15 18 450:7 503:15 617:13 618:4 619:2 620:13,19 636:1 18-15 510:1,19,23 511:6,11 512:6,7 185 613:13 19 569:12,16 570:9 595:4 195 458:9,14 1990s 660:16 1997 563:11 1st 487:12 513:6 619:16	476:22 477:22 478:15 479:2,20 480:15 510:5 514:13 526:20 544:13,19 545:4,18 546:3,8,21 547:5,11 553:12 556:17 619:5 620:3 2017/2018 482:6 2018 390:7 393:1 396:22 416:13 427:7 460:17,24 467:24 482:3 507:22 510:15 510:20 513:4 516:19 524:18 535:4,5 545:10 547:2 553:14 557:2 570:8 579:19 579:23 580:1,12 581:24 584:10 586:16 594:1 600:15 602:13 605:3 617:11 617:12 619:16 661:8 674:6 2019 513:8 544:5 570:10 579:13 581:21 584:24 588:11 589:11 590:9 590:13 591:21 592:15 593:1 594:15 604:18 2020 585:4,12 590:14 593:8 594:6,16 604:18 657:22 2021 592:16,17 594:12,21 2022 587:9 589:14 592:6 594:7,21,22 604:9 605:8 2031 606:17 20th 396:22 507:22 557:1 609:15 21 454:3 585:12 594:15 611:14 21.42 531:17 22 464:23 521:19,20 521:21 580:20 586:24 589:2 603:6 603:9 606:20 620:24 220 393:8 512:8 607:18 23 470:17,24 522:9,9 233 537:6 24 453:3,6 470:17,24 483:9 526:12 531:18 607:6 25 475:12 26 474:24 578:7 579:6	265 391:6 27 481:3 28 480:23 481:3 2G 492:4 493:10 663:6 2nd 482:2,5 483:20 484:3 487:12,14,16	415 677:17 416 677:18 417 606:14 419 677:19 427 676:18 434 676:19 437 676:20 439 676:21,22 440 676:23 441 676:24 442 677:1 458 612:10 613:16 461 677:2 467 677:3 468 677:4 474 677:6,7 4770 561:16 478 677:8 480 677:9 484 677:10 487 675:7 4G 493:10 664:19	6 6 390:1 409:11 427:12 445:5 522:19 576:8 591:13 592:17 605:19 606:10 614:5 635:24 636:1,12 654:5,12 657:10 658:20 6,000 470:11 6:32 673:15 615 676:1 617-728-4404 390:24 617.727.2200 392:10 617.742.0208 392:22 617.951.1400 391:8 620 676:14 625 676:2 669 676:3	7 7 445:5,9 483:9 538:6 538:6 614:5 621:3 622:6 636:11,12 7.54 518:10 7.96 538:24 540:1 552:19 73 553:20 554:21 781.907.2123 391:19 792 553:10	8 8 429:13 445:14	9 9 393:19 435:12 445:14 516:3,7,10 523:23 525:6 614:6 9.26 544:2,6 552:19 552:24 553:11,19 9.63 518:13 9.8 517:23 9.80 518:22 519:13 920 537:1,5 541:20 542:2 547:17,21,22 548:5,5 549:7,21 550:7,18,23 553:2,7 553:10,12,24 921 547:17 548:6,13 549:3,7,22 550:7,18 550:23 553:2,7,10 553:12,24 922 545:15 923 547:17 548:6,10 550:1,4,4,8,14,17,23 553:2,7 926 552:5 553:15	
2 2 400:17 571:19 572:22 580:15 592:8 608:17 641:8 651:9 652:20 2.44 522:24 2.5 650:16,17,20 651:19 652:5,10 653:18 2.7 609:19 20 421:13 526:11 594:15 200-year-old 655:17 2011 567:3 2012 449:9 450:3 503:14 2014 447:2 448:8 449:9 450:3 2015 462:17 467:24 2016 427:2 456:18 457:24 458:4 460:22 462:17 467:24 564:5 564:8 605:2 2017 396:14 401:9,20 404:13,18 411:6,6 413:11 416:12 426:18 427:4,7 437:14 451:19 457:3 457:8 460:17,23 462:17 467:24 475:2	2 2 400:17 571:19 572:22 580:15 592:8 608:17 641:8 651:9 652:20 2.44 522:24 2.5 650:16,17,20 651:19 652:5,10 653:18 2.7 609:19 20 421:13 526:11 594:15 200-year-old 655:17 2011 567:3 2012 449:9 450:3 503:14 2014 447:2 448:8 449:9 450:3 2015 462:17 467:24 2016 427:2 456:18 457:24 458:4 460:22 462:17 467:24 564:5 564:8 605:2 2017 396:14 401:9,20 404:13,18 411:6,6 413:11 416:12 426:18 427:4,7 437:14 451:19 457:3 457:8 460:17,23 462:17 467:24 475:2	3 3 512:9,10 518:5 519:5,12 520:18 570:12 571:9,13,16 572:7 573:7 576:8 587:20 588:4 589:3 590:1 624:6 659:23 3/31/2018 603:16 30 443:23 568:7,12 31st 460:23 481:21 482:5 483:20 484:2 487:11 32 625:16 33 392:20 608:17,18 610:3 333 454:4 455:24 456:10,10,15,18 457:16 458:1,5,10 458:17 460:2 340 481:5,6 35 436:11 500:14,17 502:5 36 613:11 36,469,751 514:12 376 537:4 39.6 607:4 390-677 390:1 395 675:5 399 675:6 3G 412:3 417:8,13,18 418:9,13,22,23 419:9,16 492:4	4 4 401:6 405:24 484:17 486:5 571:8,8 575:8 621:19 662:11 4-29 462:13 4-41 431:13,14 4,000 470:11 40 391:17 400 422:5 403 676:17 404 677:5 405 677:13 408 677:14 409 677:15 411 677:16	5 5 415:17 518:11 524:2 567:19,20 572:22 575:9,10,12,16 576:21 590:18 654:5 5,00 393:8 5,7 455:14 50 436:21 525:11 50-year 525:18 503 677:11 505 675:8 506 677:12 507 675:11 509 675:12 512 675:13 516 675:14 521 676:15,16 524 675:15 676:13 527 675:16 676:6 531 675:17 532 675:19 533 675:21 538 676:12 545 676:9 547 676:10 55 568:22 55,000 447:3 555 676:11 556 675:23 560 675:24 599 475:1,15 476:20 477:21 478:9 479:21	6 6 390:1 409:11 427:12 445:5 522:19 576:8 591:13 592:17 605:19 606:10 614:5 635:24 636:1,12 654:5,12 657:10 658:20 6,000 470:11 6:32 673:15 615 676:1 617-728-4404 390:24 617.727.2200 392:10 617.742.0208 392:22 617.951.1400 391:8 620 676:14 625 676:2 669 676:3	7 7 445:5,9 483:9 538:6 538:6 614:5 621:3 622:6 636:11,12 7.54 518:10 7.96 538:24 540:1 552:19 73 553:20 554:21 781.907.2123 391:19 792 553:10	8 8 429:13 445:14	9 9 393:19 435:12 445:14 516:3,7,10 523:23 525:6 614:6 9.26 544:2,6 552:19 552:24 553:11,19 9.63 518:13 9.8 517:23 9.80 518:22 519:13 920 537:1,5 541:20 542:2 547:17,21,22 548:5,5 549:7,21 550:7,18,23 553:2,7 553:10,12,24 921 547:17 548:6,13 549:3,7,22 550:7,18 550:23 553:2,7,10 553:12,24 922 545:15 923 547:17 548:6,10 550:1,4,4,8,14,17,23 553:2,7 926 552:5 553:15

DPU 17-170 - National Grid - Vol. 6 - 5/10/2018

31

94 393:8				
----------	--	--	--	--

FARMER ARSENAULT BROCK LLC