0,11	1. Q# LOK L		(	B. Psyc	hometr	ic Flaws	3	4.	Job Con	tent Fl	aws	5. C	ther	6.	7.
Q#	(F/H)		Stem Focus		T/F	Cred. Dist.	Partial	Job- Link	Minutia	#/ units	Back- ward		SRO Only	U/E/S	Explanation
1N99	Н	3												S	D, CR, 41.10
2N99	Н	3												Ø	D, CR, 41.9
3N01	F	3												S	D, CR, 41.4
4N99	F	3												S	D, CR, 41.13
<u>5</u>	Н	3												Ø	D, CR, 41.10
<mark>6</mark>	F	3												Ø	A, CR, 41.10
7	Н	3												S	C, CR, 41.10
8	Н	3												S	D, CR, 41.4
9	Н	3												S	C, CR, 41.10

[Refer to Section D of ES-401 and Appendix B for additional information regarding each of the following concepts.]

- Enter the level of knowledge (LOK) of each question as either (F)undamental or (H)igher cognitive level. 1.
- 2. Enter the level of difficulty (LOD) of each question using a 1 - 5 (easy - difficult) rating scale (questions in the 2 - 4 range are acceptable).
- 3.
- Check the appropriate box if a psychometric flaw is identified:

  The stem lacks sufficient focus to elicit the correct answer (e.g., unclear intent, more information is needed, or too much needless information).

  The stem or distractors contain cues (i.e., clues, specific determiners, phrasing, length, etc).

  The answer choices are a collection of unrelated true/false statements.

  One or more distractors is (are) not credible.

  One or more distractors is (are) partially correct (e.g., if the applicant can make unstated assumptions that are not contradicted by stem).
- 4. Check the appropriate box if a job content error is identified:
  - in content).
  - The question is not linked to the job requirements (i.e., the question has a valid K/A but, as written, is not operational The question requires the recall of knowledge that is too specific for the closed reference test mode (i.e., it is not required to be known from

memory).

- The question contains data with an unrealistic level of accuracy or inconsistent units (e.g., panel meter in percent with question in gallons). The question requires reverse logic or application compared to the job requirements.
- 5. Check questions that are sampled for conformance with the approved K/A and those that are designated SRO-only (K/A and license level mismatches are unacceptable).
- Based on the reviewer's judgment, is the question as written (U)nacceptable (requiring repair or replacement), in need of (E)ditorial enhancement, or (S)atisfactory?
- At a minimum, explain any "U" ratings (e.g., how the Appendix B psychometric attributes are not being met).

0,11	1. 2. LOK LOD			3. Psych	nometr	ic Flaws			4. Job Co	ntent Fla	aws	5.	. Other	6.	7.
Q#	LOK (F/H)	(1-5)	Stem Focus	Cues	T/F	CredDist	Partial	Job- Link	Minutia	#/ units	Back-ward	Q= K/A	SRO Only	U/E/S	Explanation
<mark>10</mark>	Н	3												S	B, CR, 41.7
11	Н	3													C, CR, 41.5 This question is U because it tests on applying a TS LCO. This makes it an SRO only question – unable to write an RO only question so replaced KA and question
12N95	Н	3												S	C, CR, 41.7
13N95	F	3												S	D, CR, 41.4
<mark>14</mark>	F	3												S	A, CR, 41.10
<mark>15</mark>	Н	3												S	A, CR, 41.7
<mark>16</mark>	Н	3												S	D, CR, 41.2
<mark>17</mark>	F	3												S	B, CR, 41.12
<mark>18</mark>	F	3												S	B, CR, 41.10
<mark>19</mark>	F	3												S	D, CR, 41.10
20	F	3												S	C, CR, 41.7
<mark>21</mark>	Н	3												S	D, CR, 41.7
22N05	F	3												S	D, CR, 41.10
<mark>23</mark>	Н	3	Е											Е	A, CR, 41.1, - Ensure steam tables are provided to candidates. Standard handout
<mark>24</mark>	F	3												S	B, CR, 41.10
<mark>25</mark>	Н	3												S	D, CR, 41.10
26N05	F	3												S	C, CR, 41.7
27N05	Н	3												S	D, CR, 41.7
28N05	F	3												S	B, CR, 41.10

0.11	1. 2.			3. Psych	nometr	ric Flaws			4. Job Co	ntent Fl	aws	5	. Other	6.	7.
Q#	LOK (F/H)	LOD (1-5)	Stem Focus	Cues	T/F	CredDist	Partial	Job- Link	Minutia	#/ units	Back-ward	Q= K/A	SRO Only	U/E/S	Explanation
<mark>29</mark>	F	3												S	A, CR, 41.10
<mark>30</mark>	Н	3												S	B, CR, 41.7
<mark>31</mark>	Н	3												S	D, CR, 41.7
32	Н	3												S	B, CR, 41.5
33	Н	3												S	A, CR, 41.7
<mark>34</mark>	Н	3												S	C, CR, 41.10
<mark>35</mark>	Н	2												S	C, CR, 41.5
<mark>36</mark>	Н	3												S	C, CR, 41.4
37	Н	3												S	D, CR, 41.10
<mark>38</mark>	Н	2												S	C, CR, 41.10
39	Н	3												S	D, CR, 41.10
<mark>40</mark>	Н	3												S	C, CR, 41.14
<mark>41</mark>	F	3												S	D, CR, 41.10
42	F	3												S	A, CR, 41.7
<mark>43</mark>	Н	3												S	A, CR, 41.7
44	F	3												S	C, CR, 41.10
<mark>45</mark>	Н	3											U	U	C, CR, 43.2 – This question is U because it tests on applying a TS LCO. This makes it an SRO only question. Question rewritten.
<mark>46</mark>	F	3												S	D, CR, 41.13
<mark>47</mark>	Н	3												S	C, CR, 41.5
<mark>48</mark>	F	3									_			S	C, CR, 41.10

0.11	1. 2.			3. Psych	nometr	ic Flaws	5	4	4. Job Cont	ent Flav	vs .	5.	Other	6.	7.
Q#	LOK (F/H)	LOD (1-5)	Stem Focus	Cues	T/F	Cred. Dist.	Partial	Job- Link	Minutia	#/ units	Back- ward	Q= K/A	SRO Only	U/E/S	Explanation
49	Н	3												S	B, CR, 41.7
50	Н	3												S	A, CR, 41.5
<mark>51</mark>	Н	3												S	C, CR, 41.7
<mark>52</mark>	Н	3												S	A, CR, 41.10
<del>53</del>	Н	3												S	D, CR, 41.10
<mark>54</mark>	F	3												S	B, CR, 41.10
<mark>55</mark>	Н	3												S	D, CR, 41.7
<mark>56</mark>	Н	3												S	D, CR, 41.6
<mark>57</mark>	Н	3												Ø	D, CR, 41.10
<del>58</del>	Н	3												Ø	A, CR, 41.7
<mark>59</mark>	F	3												Ø	D, CR, 41.10
<mark>60</mark>	Н	3												S	C, CR, 41.7
<mark>61</mark>	F	3												Ø	B, RC, 41.4
<mark>62</mark>	Н	3												S	B, RC, 41.4
<mark>63</mark>	F	2												S	C, CR, 41.4
64	Н	2											E		D, CR, 41.10 – This is a borderline SRO question. Recommend referencing a control room refueling procedure that contains the same information if possible.  Question rewritten
<mark>65</mark>	Н	2												S	B, CR, 41.1
<mark>66</mark>	Н	3												S	C, CR, 41.5

0"	1. 2. LOK LOD		3. Psychometric Flaws						4. Job Cont	ent Flaw	/S	5. (	Other	6.	7.
Q#	(F/H)	(1-5)	Stem Focus	Cues	T/F	Cred Dist.	Partial	Job- Link	Minutia	#/ units	Back- ward	Q= K/A	SRO Only	U/E/S	Explanation
<mark>67</mark>	F	2												S	B, CR, 41.7
68	F	2												S	A, CR, 41.10
<mark>69</mark>	F	2												S	B, CR, 41.10
<mark>70</mark>	F	3												S	B, CR, 41.4
71	Н	3												S	C, CR, 41.8
72	Н	4												S	C, CR, 41.12
<mark>73</mark>	Н	3												S	A, CR, 41.7
74	Н	3												S	B, CR, 41.7
<mark>75</mark>	Н	3												S	D, CR, 41.5
<mark>76</mark>	F	3												S	A, CR, 43.3
<mark>77</mark>	F	3												S	D, CR, 43.2
<mark>78</mark>	Н	3												S	D, CR, 43.5
<mark>79</mark>	Н	2												S	B, CR, 43.2
80	Н	3												S	D, CR, 43.5
81	F	2												S	D, CR, 43.7
82	Н	3												S	A, CR, 43.5
83	Н	3												S	D, CR, 43.5
84	Н	3												S	C, CR, 43.5
<mark>85</mark>	Н	3												S	B, CR, 43.5
86	Н	3												S	B, CR, 43.5
<mark>87</mark>	Н	3												S	C, CR, 43.5

0,1	1.	2.		3. Psych	nometr	ric Flaws	3		4. Job Cont	ent Flaw	/S	5. (	Other	6.	7.
Q#	LOK (F/H)	LOD (1-5)	Stem Focus	Cues	T/F	Cred Dist.	Partial	Job- Link	Minutia	#/ units	Back- ward	Q= K/A	SRO Only	U/E/S	Explanation
88	Н	3												S	A, CR, 43.5
89	Н	3												S	C, OR, 43.2
90	Н	3												S	A, CR, 43.5
<mark>91</mark>	Н	3												S	C, CR, 43.5
92	Н	3											U	U	B, CR, 41.10 – This question is U because it is testing on operator actions which makes it an RO question. Left as is - question requires operability determination which makes it SRO only
93	Н	3												S	D, CR, 43.5
94	Н	3												S	A, CR, 43.5
<mark>95</mark>	Н	3												S	B, CR, 43.5
<mark>96</mark>	F	2												S	C, CR, 41.10
<mark>97</mark>	Н	3												S	B, CR, 43.5
<mark>98</mark>	F	3												S	A, CR, 41.10
99	Н	3												S	D, CR, 43.5
100	Н	3												S	B, CR, 43.5
RO B=34 (45%) M=0 N=41 (55%)	H F	I = 48 (6 = 27 (3	64%) 66%)									U = 1 E = 2 S = 72			RO TOTALS
SRO B=6 (24%) M=0 N=19 (76%)	H	l = 16 (6 = = 9 (36	64%) 6%)										U = 1 E = 0 S = 24		SRO TOTALS

## **GENERAL COMMENTS:**

1. This exam review was performed by S. Garchow the week of 9/17/2007.

0,11	1.	2.	3. Psychometric Flaws					4. Job Content Flaws					5. Other		7.	
Q#	LOK (F/H)	LOD (1-5)	Stem Focus	Cues	T/F	Cred Dist.	Partial	Job- Link	Minutia	#/ units	Back- ward	Q= K/A	SRO Only	U/E/S	Explanation	

- Bank questions are indicated by B; Modified are indicated by M; New questions are indicated by N. Those questions that were previously used on an NRC exam are denoted by the question number followed by an N and the last two digits of the year of the exam (e.g. 26N05).
- Comment resolution is indicated in blue.
- Average difficulty is 2.91 on the RO exam and 2.88 on the SRO exam. Both these values are within the 2.8 3.2 difficulty band typically seen on an average exam by this reviewer.
- The 10CFR55.41/43 question distribution for RO and SRO is:

41.1 = 2	43.1 = 0
41.2 = 2	43.2 = 3
41.3 = 0	43.3 = 1
41.4 = 8	43.4 = 0
41.5 = 7	43.5 = 17
41.6 = 1	43.6 = 0
41.7 = 20	43.7 = 1
41.8 = 1	41.10 = 3
41.9 = 1	
41.10 = 27	
41.11 = 0	
41.12 = 2	
41.13 = 2	
41.14 = 2	

The answer distribution is RO/SRO:

A = 13 (17%) / 6 (24%)B = 16 (22%) / 7 (28%)

C = 21 (28%) / 5 (20%)

D = 25 (33%) / 7 (28%)

- The distribution of New, Modified, and Bank questions meet the requirements contained in ES-401-6, Written Exam Quality Checklist. concur
- This reviewer identified 48 questions (64%) of the questions on the RO exam as being higher cognitive. This is three questions outside the 50-60% required band as by ES-401-6, Written Exam Quality Checklist. (utility determined 54.6% were higher cognitive - considered acceptable as is) defined
- This reviewer identified 16 questions (64%) of the questions on the SRO exam as being higher cognitive. This is acceptable, but is one question outside the recommended 50-60% band contained in ES-401-6, Written Exam Quality Checklist. Concur as acceptable
- 10. There are 10 questions that have been used on previous NRC initial license exams. Of these, four were used on the previous NRC exam (2005) and is within the guidance contained in ES-401-6. Written Exam Quality Checklist. (There were none from the 2003 exam.) concur
- The correct answer distribution is slightly skewed toward distractor D, but is acceptable. concur