

Development of PRA Qualification Guidance and Curriculum

based on EPRI Report 1011981

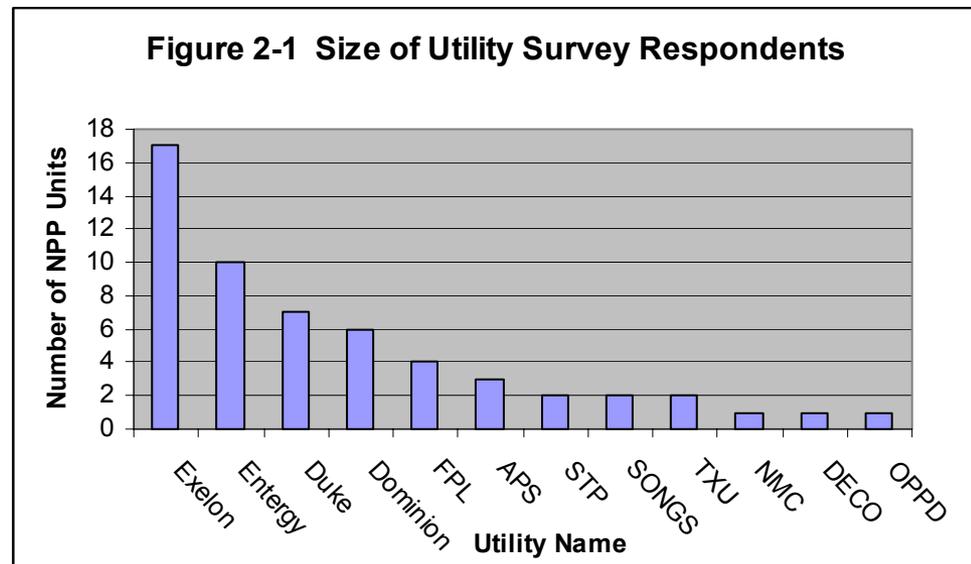
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Survey of Utility Training Practices

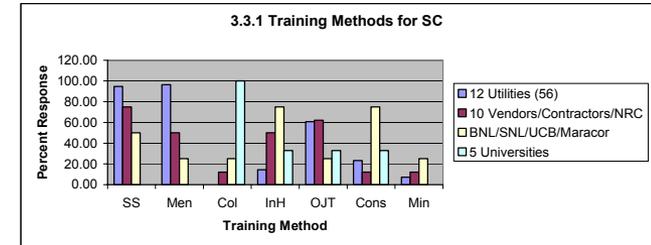
- Survey responses received from:
 - 12 representative utilities (56 NPP units)

- NEI
- 3 NSSS vendors
- 5 contractors
- NRC NRR & RES staff, BNL, Sandia
- 6 university professors

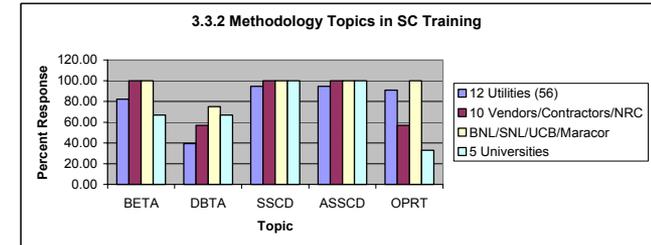


Typical Report Displays of Survey Responses

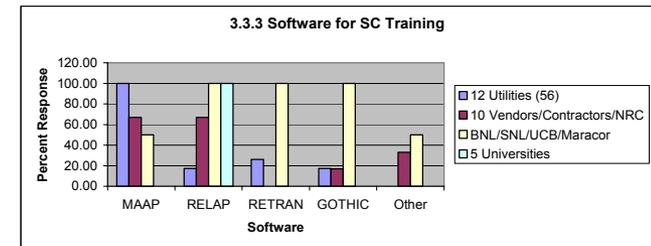
Q34 3.3.1 Select one or more training methods for SC	UTILITY		GROUP 1		GROUP 2		GROUP 3	
	Responses	Percent	Responses	Percent	Responses	Percent	Responses	Percent
Self-Study	53	94.64	6	75.00	2	50.00	0	0.00
Mentoring	54	96.43	4	50.00	1	25.00	0	0.00
College or University Course	0	0.00	1	12.00	1	25.00	3	100.00
In-house Training Programs	8	14.29	4	50.00	3	75.00	1	33.00
On-the-job Training	34	60.71	5	62.00	1	25.00	1	33.00
Training provided by consultant	13	23.21	1	12.00	3	75.00	1	33.00
Minimal training with technical support from consultant	4	7.14	1	12.00	1	25.00	0	0.00
Total	56	100.00	8	100.00	4	100.00	3	100.00
Q60 Enter the number of hours devoted to training in	0	0.00	0	0.00	0	0.00	0	0.00
Total 2 Average 2.5	0	0.00	0	0.00	0	0.00	0	0.00
	0	0.00	0	0.00	0	0.00	0	0.00



Q107 3.3.2 Select all methodology topics addressed i	UTILITY		GROUP 1		GROUP 2		GROUP 3	
	Responses	Percent	Responses	Percent	Responses	Percent	Responses	Percent
Best Estimate Thermal/hydraulic Analysis	46	82.14	7	100.00	4	100.00	2	67.00
Design Basis Thermal-hydraulic Analysis	22	39.29	4	57.00	3	75.00	2	67.00
System Success Criteria Determination	53	94.64	7	100.00	4	100.00	3	100.00
Accident Sequence Success Criteria Definition	53	94.64	7	100.00	4	100.00	3	100.00
Offsite Power Recovery Timing	51	91.07	4	57.00	4	100.00	1	33.00
Total	56	100.00	7	100.00	4	100.00	3	100.00
	0	0.00	0	0.00	0	0.00	0	0.00



Q106 3.3.3 What software is used for SC Training? (UTILITY		GROUP 1		GROUP 2		GROUP 3	
	Responses	Percent	Responses	Percent	Responses	Percent	Responses	Percent
MAAP	46	100.00	4	67.00	1	50.00	0	0.00
RELAP	8	17.39	4	67.00	2	100.00	1	100.00
RETRAN	12	26.09	0	0.00	2	100.00	0	0.00
GOTHIC	8	17.39	1	17.00	2	100.00	0	0.00
Other	0	0.00	2	33.00	1	50.00	0	0.00
Total	46	100.00	6	100.00	2	100.00	1	100.00
	0	0.00	0	0.00	0	0.00	0	0.00



Survey Conclusions

- Most RM/PRA training is self-study; structure varies
- Nearly all utilities certify RM/PRA engrs. with Qual Cards
 - Wide variation in rigor, detail, assessment
- This certification is supported by mentoring and OJT
- Nearly all classroom training by vendors/consultants
 - Little use of SAT, lesson plans
- Most RM/PRA engrs. have engrg. degree; many SROs
- RM/PRA engrs. are trained in all Level 1 tech. elements
- Few are trained in Level 2 / 3 tech. elements
- Few are trained in external events
- There is wide variation in RI-applications training

RM/PRA Engineer Training Objectives

- Prepared training objectives based on
 - Bloom's cognitive learning model taxonomy



- PRA standards and other references
- Objectives include all Level 1 technical elements, Level 2, Level 3, external events, fire, LPSD, RI-applications
- Identified gaps in current RM/PRA engr. training practices compared to training objectives
- Recommended training developments to eliminate gaps

Utility RM/PRA Engr. Initial Qual Card Template

- Provides format and content guidance
- Specifies qualification requirements based on
 - utility qual card best practices
 - EPRI Report 1011981 training objectives
- Qualification requirements include
 - prerequisites
 - knowledge of specified references
 - specified PRA fundamentals
 - Level 1, 2, 3 PRA technical elements
 - external events, fire, LPSD PRAs
 - risk management applications