Public Meeting with Industry Operator Licensing Representatives

September 21, 2023

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Safety Message

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Introductions and Opening Remarks

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Examination Scheduling

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The examination scheduling process is working.

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2024 National Examination Schedule - 3rd QTR

BRQ EXAD NEXAD OV NOV

	June	July				August				September				
	06/30/2024	07/07/2024	07/14/2024	07/21/2024	07/28/2024	08/04/2024	08/11/2024	08/18/2024	08/25/2024	09/01/2024	09/08/2024	09/15/2024	09/22/2024	09/29/2024
R1		GINN OV 0/0/0 2 exmrs (R1)		GINN EXAD 4/4/4 2 exmrs (R1)				MILL OV 0/0/0 2 exmrs (R1)	BV OV 0/0/0 4 exmrs (R1) Lally (CE)			MILL EXAD 4/4/4 2 exmrs (R1)		
R2						WB OV 0/0/0 2 exmrs (R2)					BRU BRQ 2 exmrs (R2)		WB BRQ 2 exmrs (R2)	
											WB EXAD 6/6/3 4 exmrs (R2)			
											ROB EXAD 6/2/4 3 exmrs (R2)			
		FAR BRQ 2 exmrs (R2)			CAT BRQ 2 exmrs (R2)	ROB OV 0/0/0 3 exmrs (R2)		CAT OV 0/0/0 3 exmrs (R2)			BF BRQ 2 exmrs (R2)		CAT EXAD 4/4/4 3 exmrs (R2)	
R3								PRAI EXAD 6/10/2 2 exmrs (R3) 1 exmr (R4)					LASA EXAD 5/7/0 3 exmrs (R3)	
		PRAI OV 0/0/0 2 exmrs (R3) 1 exmr (R4)		COOK EXAD 8/7/3 4 exmrs (R3) 1 exmr (R4)	COOK EXAD 8/7/3 4 exmrs (R3) 1 exmr (R4)		PRAI EXAD 6/10/2 2 exmrs (R3) 1 exmr (R4)	LASA OV 0/0/0 3 exmrs (R3)			MONT OV 0/0/0 3 exmrs (R3)	POIN BRQ 2 exmrs (R3)	CLIN OV 0/0/0 2 exmrs (R3)	LASA EXAD 5/7/0 3 exmrs (R3)
R4		STP OV 0/0/0 1 exmr (R4)	ANO BRQ 1 exmr (R4)				RBS OV 0/0/0 1 exmr (R4)	STP EXAD 8/13/0 1 exmr (R4)			RBS BRQ 1 exmr (R4)	PALO BRQ 1 exmr (R4)	CP BRQ 1 exmr (R4)	RBS EXAD 6/3/3 1 exmr (R4)

Be flexible.

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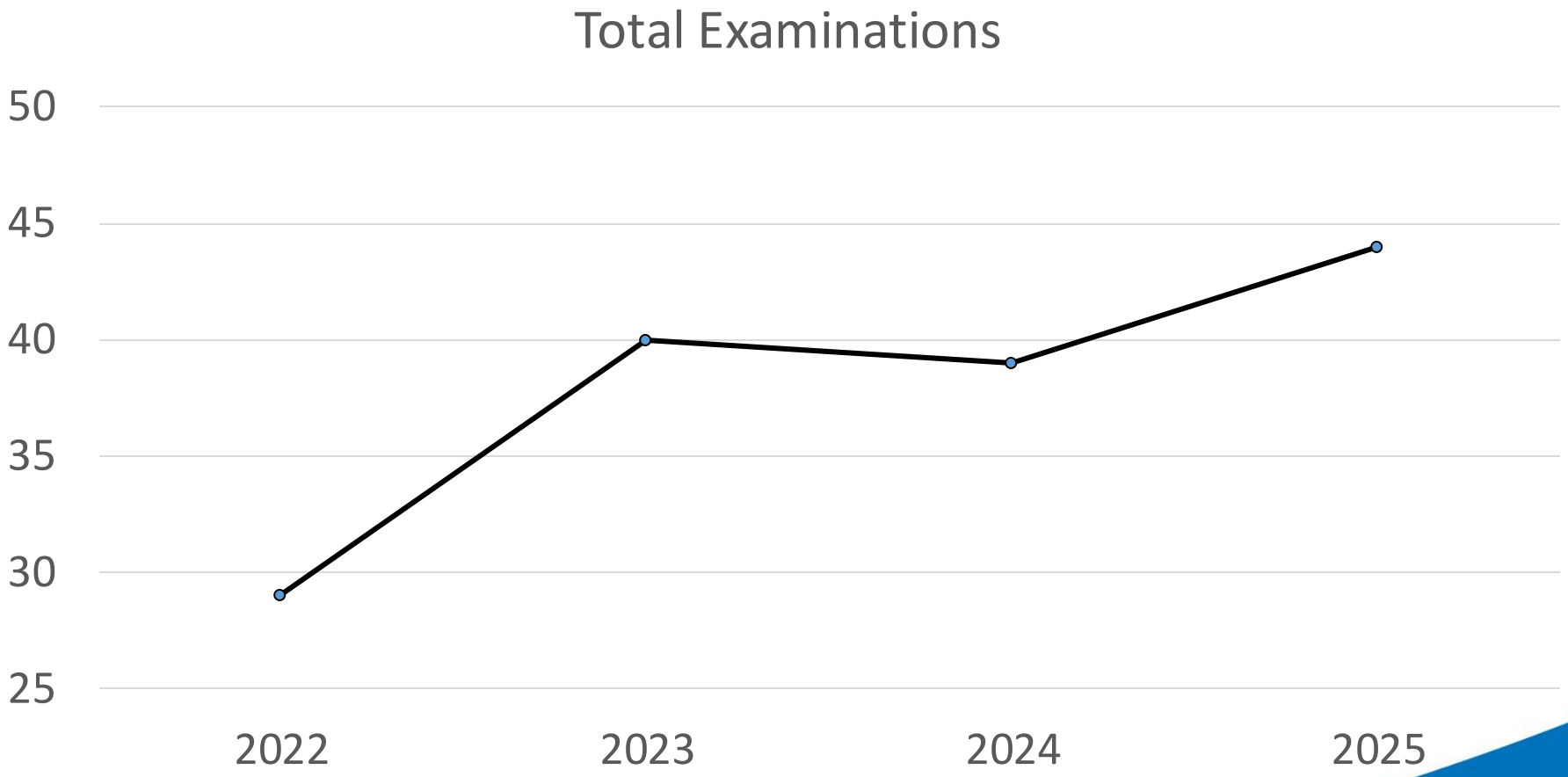

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Written Examination Outline Generator

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The outline generator saves time and increases accuracy.

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Welcome to the online exam topic generator.

This application selects exam topics for BWRs and PWRs in conformance with NUREG-1122.

Input parameters below and click on "Generate" to select exam topics

Site: Calvert Cliffs
Exam Date: 09/08/2023
Randomize Topics? (check for yes):
Generate Exam Topics

Question Number	Topic Title	Topic Importance	Topic Category	Topic System
1	(011EK2.05) Knowledge of the relationship between (EPE 11) LARGE-Break LOCA and the following systems or components (CFR: 41.7 / 45.7): ECCS	4.3	K2	395004
2	(015AA2.13) Ability to determine and/or interpret the following as they apply to (APE 15) REACTOR COOLANT Pump Malfunctions (CFR: 43.5 / 45.13): RCP ammeter	3.3	A2	395005
3	(395015) (G2.4.34) EMERGENCY PROCEDURES/PLAN: Knowledge of RO responsibilities outside the main control room during an emergency (CFR: 41.10 / 43.5 / 45.13)	4.2	G	395015
4	(038EK3.15) Knowledge of the reasons for the following responses and/or actions as they apply to (EPE 38) STEAM GENERATOR Tube Rupture (CFR: 41.5 / 41.10 / 45.6 / 45.13): Cooling and depressurizing isolated S/G	3.9	K3	395011
5	(BE10EK1.11) Knowledge of the operational implications and/or cause and effect relationships of the following concepts as they apply to (BW E10) POST-TRIP STABILIZATION (CFR: 41.5 / 41.7 / 45.7 / 45.8): RCS leak (LOCA)	4.1	K1	395001
6	(077AA1.04) Ability to operate and/or monitor the following as they apply to (APE 77) GENERATOR VOLTAGE AND ELECTRIC Grid Disturbances (CFR: 41.5 / 41.10 / 45.5 / 45.7 / 45.8): Reactor controls	3.6	A1	395020
7	(057AK2.11) Knowledge of the relationship between (APE 57) LOSS OF VITAL AC ELECTRICALINSTRUMENT BUS and the following systems or components (CFR: 41.7 / 45.7): CVCS instrumentation	3.6	K2	395016
8	(055EA2.06) Ability to determine and/or interpret the following as they apply to (EPE 55) Station Blackout (CFR: 43.5 / 45.13): Faults and lockouts that must be cleared before reenergizing buses	3.9	A2	395014
9	(395008) (G2.4.37) EMERGENCY PROCEDURES/PLAN: Knowledge of the lines of authority during implementation of the emergency plan implementing procedures (CFR: 41.10 / 45.13)	3	G	395008
10	(CE05EK3.12) Knowledge of the reasons for the following responses and/or actions as they apply to (CE E05) EXCESS STEAM DEMAND (CFR: 41.5 / 41.10 / 45.6 / 45.13): Restoring letdown	3	K3	395012
11	(008AK1.05) Knowledge of the operational implications and/or cause and effect relationships of the following concepts as they apply to (APE 8) PRESSURIZER VAPOR Space Accident (CFR: 41.8 / 41.10 / 45.3): Probable PZR steam space leakage paths other than PORV or code safety	3.6	K1	395002
12	(022AA1.07) Ability to operate and/or monitor the following as they apply to (APE 22) LOSS OF REACTOR Coolant Makeup (CFR: 41.7 / 45.5 / 45.6): Excess letdown containment isolation valves	3.1	A1	395006

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Examination development tools are available.

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- The publicly-available web-based code for the outline generator is coming soon.
- PWR KA Catalog Excel File https://www.nrc.gov/reading-rm/doc-collections/nuregs/staff/sr1122/r3/index.html
- BWR KA Catalog Excel File https://www.nrc.gov/reading-rm/doc-collections/nuregs/staff/sr1123/r3/index.html
- AP1000 KA Catalog Excel File https://www.nrc.gov/reading-rm/doc-collections/nuregs/staff/sr2103/index.html
- NUREG-1021 Rev 12 exam forms Excel Files https://www.nrc.gov/media/reading-rm/doc-collections/nuregs/staff/sr1021/r12/sr1021r12forms-xlsx.zip

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Operator Licensing Public Dashboard

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We are creating an Operator Licensing Public Dashboard.

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- The NRC public website is being updated fall 2023 with an interactive display of exam results that will update automatically as exams are completed.
- This will supersede the static PDF document (ML23082A071) that is updated annually.
- Details on the level of interaction available on the public website are still being finalized.

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Operator Licensing Program Feedback

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The Operator Licensing Program Feedback database provides a lot of useful information.

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- https://www.nrc.gov/reactors/operator-licensing/prog-feedback.html
- Answers to previously asked questions about operator licensing topics
- Organized by NUREG-1021 section, IP 71111.11, simulator, and general topics
- Historical information located in the “Archived Questions OLPF”

Contact us for questions not answered by the Operator Licensing Program Feedback database.

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- If additional information needed, can contact us
  - https://www.nrc.gov/reactors/operator-licensing/contact-us.html
- Response back to the individual
  - May add to the OLPF or next NUREG revision depending on the topic and question

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Advanced Reactors

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Advanced Reactor work is steadily increasing.

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- Ongoing reviews of white papers, topical reports, and licensing submittals from advanced reactor designers such as X-energy, TerraPower, Westinghouse, Oklo, General Electric, HOLTEC, and NuScale

- Stakeholder engagement on topics like flexible plant operations (e.g., grid load following, H2 production, etc.), artificial intelligence, simulation technologies, advanced digital interfaces, and remote and autonomous operations

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Ongoing Regulatory Activities

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Three ongoing rulemaking activities involve operator licensing topics.

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1. Part 53 proposed rulemaking (with the Commission)
   - New framework for staffing, personnel qualifications, training programs, operator licensing examinations, and human factors
   - Provisions for load following, online refueling, customized licensed operator staffing, engineering expertise, facilities administering own operator licensing examinations, and the tailoring of operator licensing examinations
   - Preliminary rule and draft guidance documents available at https://www.regulations.gov/docket/NRC-2019-0062/document

Three ongoing rulemaking activities involve operator licensing topics.

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2. Parts 50 and 52 Alignment of Licensing Processes and Lessons Learned from New Reactor Licensing Rulemaking (proposed rule with the Commission):
   - Clarifies how the plant-referenced simulator applies to plant that is under construction
   - Allows use of alternatives for in-plant JPMs when plant is under construction
   - Allows licensee to request waiver of examination and test requirements when applicant applies for a license for unit(s) of the same design
   - Requires licensee to maintain an applicant's KSAs when there is time gap between passing initial licensing examination and participation as a licensed operator in the licensed operator requalification program
   - Includes draft regulatory guidance that will accompany proposed rule:
     - Draft NUREG-1021 Rev. 13
     - Draft RG-1.149 Rev. 5
       - Addresses ANSI/ANS-3.5-2018

Three ongoing rulemaking activities involve operator licensing topics.

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3. Regulatory Improvements for Production and Utilization Facilities Transitioning to Decommissioning Rulemaking (final rulemaking in process):

   - Includes an alternative approach that avoids the need for separate CFH training program approval
   - Specifies that neither the STA nor licensed operators are required at a decommissioning plant
   - Clarifies the applicability of training rule program requirements to avoid requiring unneeded programs

There are additional resources for operator licensing for new reactors.

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- Issued draft ARCAP guidance on organization and human-system considerations to support non-LWR reviews under Part 50 or 52

  - Available at https://www.regulations.gov/document/NRC-2022-0078-0004

- New FAQ resource for new reactor facility applicants

  - Available at https://www.nrc.gov/reactors/operator-licensing/licensing-process/faq-operator-licensing.html

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NUREG-1021 Revision 12 Effectiveness Review

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We continue to monitor the use of NUREG-1021 Rev 12.

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- Effectiveness review was initiated in May 2022 to do the following:
  - Monitor the use of new and revised instructions and guidance in NUREG-1021, Revision 12
  - Determine if additional actions are needed (i.e., training or clarifications)
  - Check for any unexpected outcomes of the changes
- Interim Report
  - 39 initial licensing examinations and 430 applicants
  - April 2022 – April 2023

The effectiveness review focuses on the major changes made in Revision 12.

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Data collection for the review includes:

- Number of generic fundamentals questions per exam
- Quality of generic fundamentals questions
- How many applicants took/did not take an NRC Generic Fundamentals Examination before their initial licensing exam
- Inspection findings
- SRO/RO performance on generic fundamentals questions
- Critical task quality
- Number of Significant and Critical Performance Deficiencies
- Time applicants spend as extra-person on shift
- Use of ACAD allowances for “related science degrees”
- Ease-of-use metrics such as hours recorded for exam development, administration and grading, and colloquial feedback
- Number of appeals
- Average pass rate

There is room for improvement in the writing of generic fundamentals questions .

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Interim Observations

- Average 7 generic fundamentals (GF) questions per examination (range 6-9)
- Generic fundamentals are sampled in Tier 2 and Tier 4 of the written examination
- Psychometric errors found:
  - GF questions marked as new/modified but do not meet the criteria for a new or modified question (they were bank)
  - GF questions not modified to make them site-specific (“Plant 1”)
  - GF question with low level of difficulty (LOD 1)
  - More than one answer choice correct, cue in stem, two-part question error in first part makes second part

Average performance on the set GF questions is 88%.

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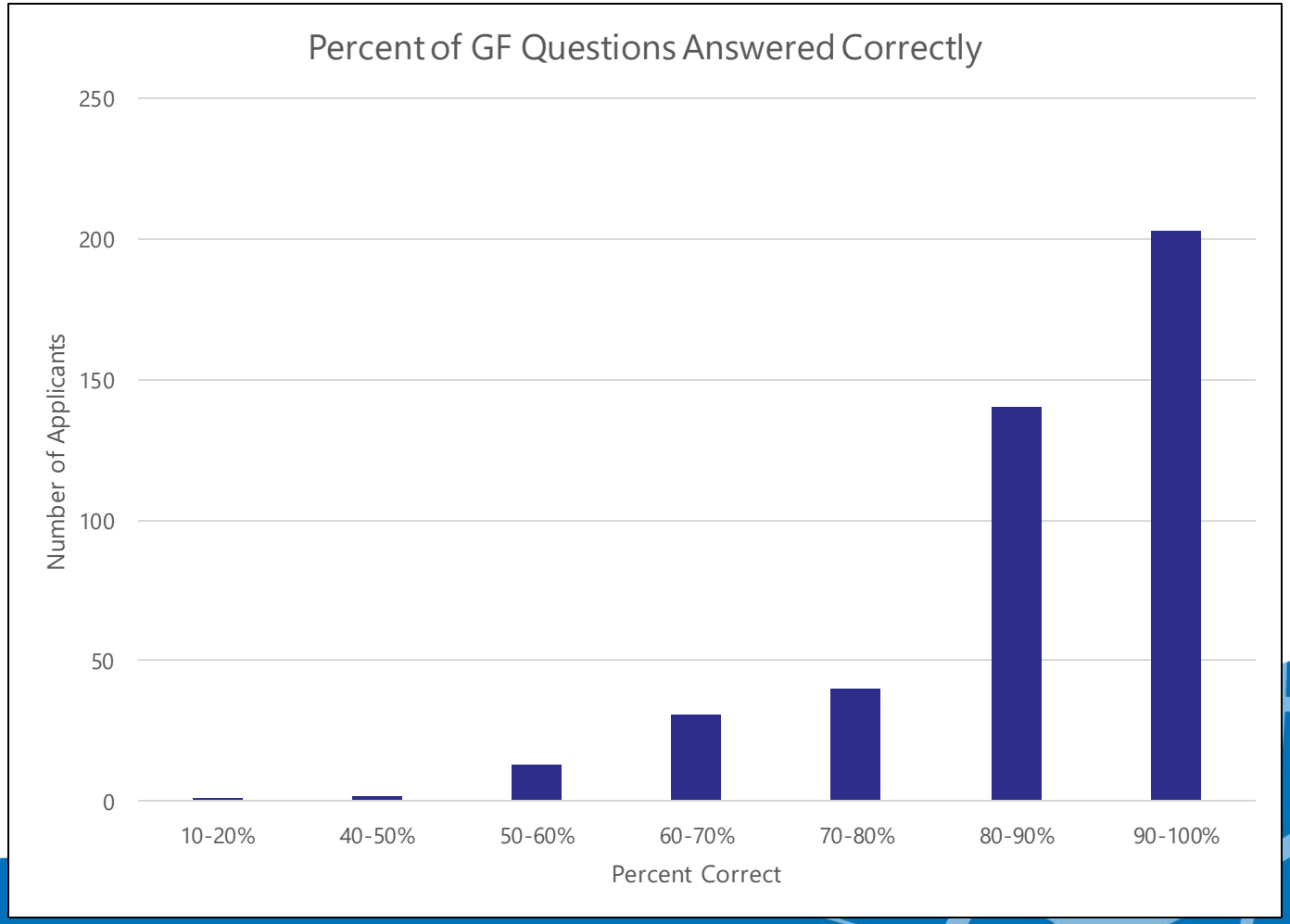
Interim Observations (430 applicants, 39 exams)



Most applicants took the NRC GFE before they took a Rev 12 Examination.

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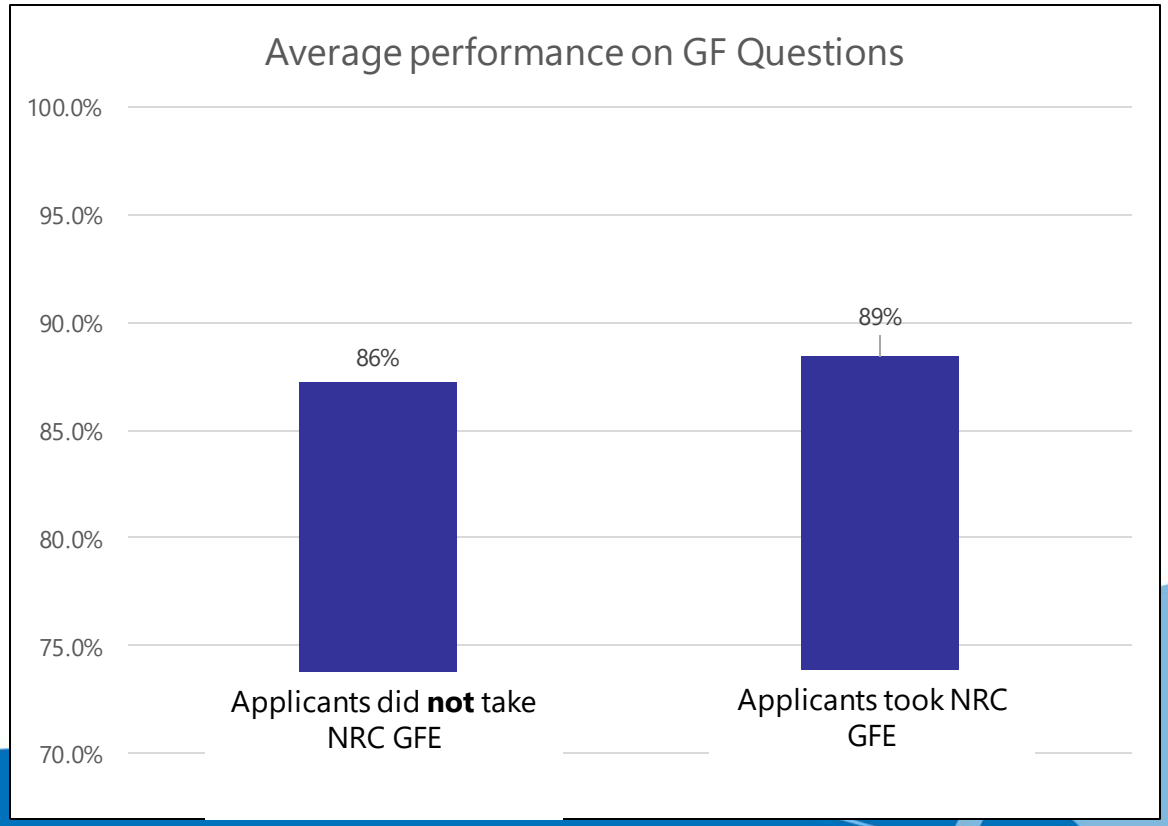
Interim Observations

- 377 of 430 applicants previously took the NRC GFE (88%)



SRO applicants performed slightly better than RO applicants on the set of GF questions.

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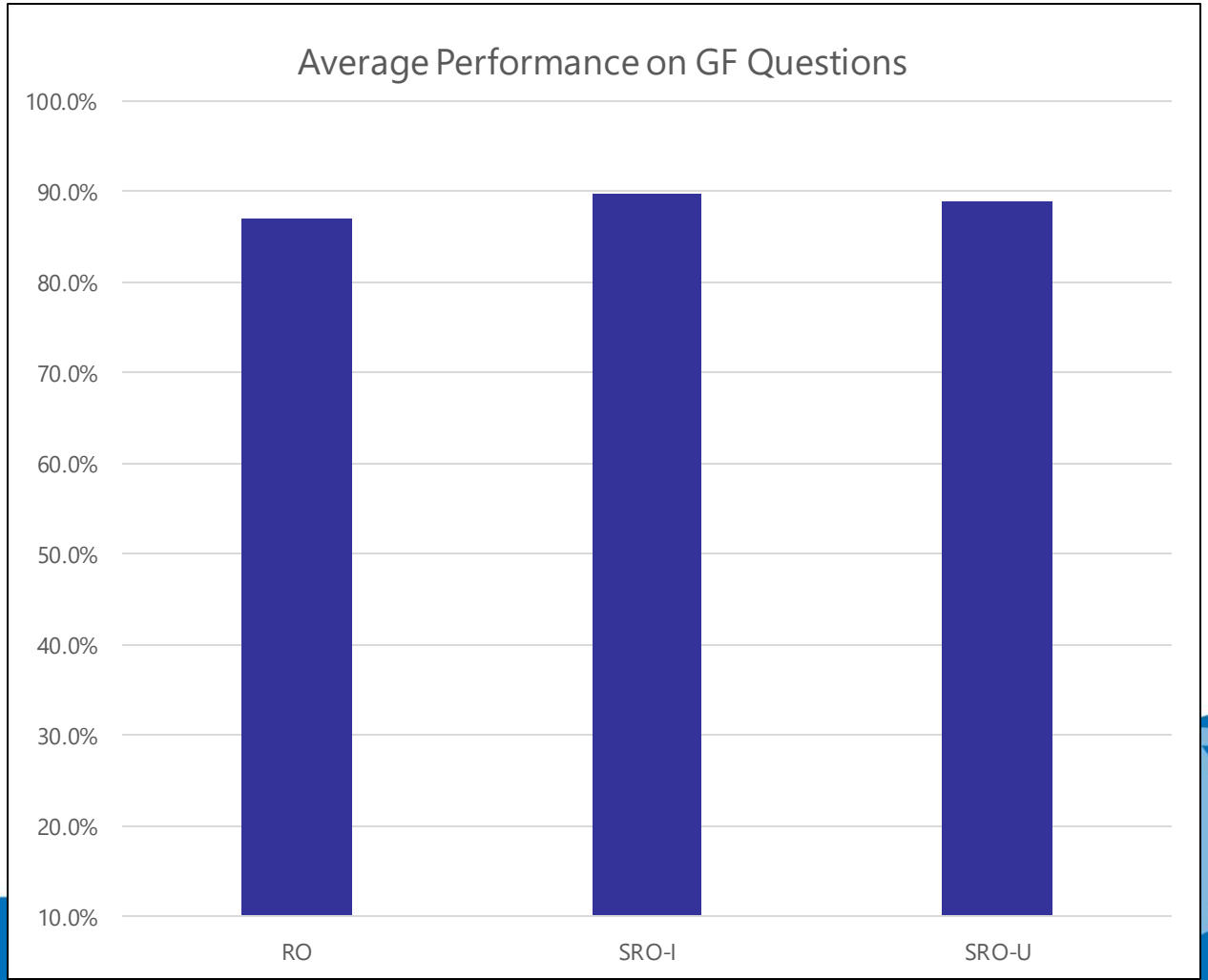
Interim Observations



It is difficult to compare NRC GFE performance with performance on the set of GF questions.

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Facility Type	No. of Exams	No. of Examinees	Mean Score (%)
BWR	101	5245	90.5
PWR	101	9357	91.3
Total	202	14602	91.0

50 question examination

Facility Type	No. of Exams	No. of Examinees	Mean Score (%)
Multiple	39	430	88.5

set of 6-9 questions

We added more actions for tracking performance on GF questions.

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Revised the effectiveness review plan to:

- Increase the duration of the review to allow for more meaningful data collection from applicants who have NOT previously taken the NRC GFE
- Include questions that may indirectly test generic fundamentals topics
- Added specific thresholds for performance that will trigger the NRC staff to revisit the sample plan distribution

Critical tasks meet the Rev 12 CT Methodology.

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Interim Observations (from sample of six operating tests):

- One task met the CT criteria but was not marked as a CT in the scenario guide (isolate a faulted steam generator)
- Alternate boundary conditions used in about 50% of CTs
- Two operating tests had alternate boundary conditions that appeared to be arbitrary (the reason for time-based conditions not documented on simulator guide)

Critical performance deficiencies are infrequent.

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Interim Observations (from 39 initial licensing examinations and 430 applicants):

- 5 critical performance deficiencies
- 18 significant performance deficiencies
- Guidance in NUREG-1021 for identifying CPDs and SPDs is being applied properly and consistently

There were very few observations of the use of new allowances in ACAD 10-001 Rev 2.

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Interim Observations (from detailed review of ~10% of applications over 1 year):

- 2 observations of an SRO-instant applicant with a “related science degree”
- Most facility licensee training programs have maintained the previous requirement for applicants to spend at least three months on shift as an extra person (EPOS)

No significant change was observed in pass/failure rates.

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Interim Observations (from 39 initial licensing examinations and 430 applicants):

Average Pass and Failure Rates		
	Rev 11 Exams	Rev 12 Exams
Pass Rate	96.5%	96.9%
Failure Rate	3.5%	3.1%
Written Test Pass Rate	95 – 98%	97.1%
Operating Test Pass Rate	98 – 99%	99.5%

7 requests for NRC staff administrative review during first year of Rev 12 initial licensing examinations

No significant change was observed in written exam average scores.

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Interim Observations (from 39 initial licensing examinations and 430 applicants):

Overall Written Examination Averages		
	Rev 11 Exams	Rev 12 Exams
RO Portion	84 – 92%	89.1%
SRO Portion	89 – 91%	90.0%
Overall Exam	90.1%	89.6%

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Industry Topics

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Public Comments

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Closing Remarks