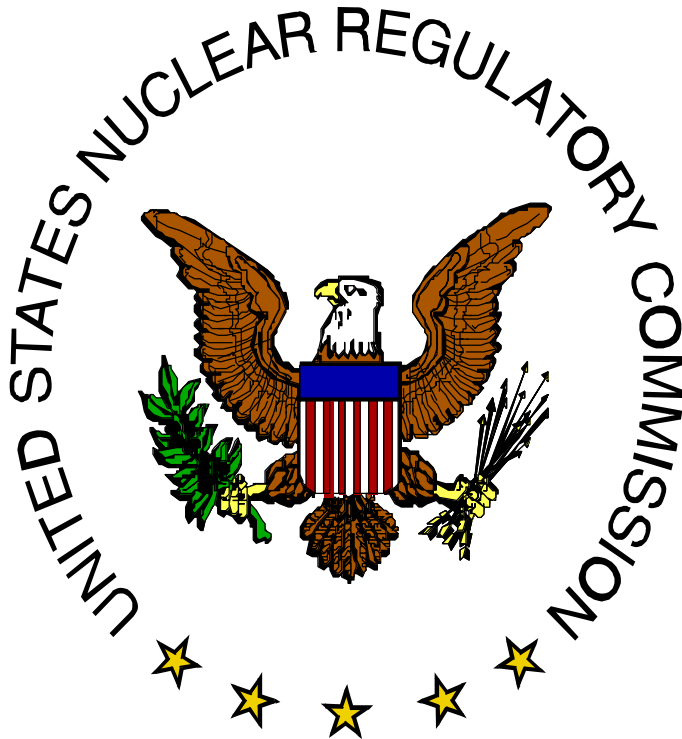


# JPM FUNDAMENTALS



Mike Bielby RIII NRC

# JPM FUNDAMENTALS

- ▶ Outline/Proposed JPM Submittal
- ▶ Quality Checklist Criteria
- ▶ Admin JPM Requirements
- ▶ Simulator/Implant JPM Requirements
- ▶ Gotcha's
- ▶ JPM Developmental Goals
- ▶ Verifiable Actions
- ▶ Critical Step
- ▶ Significantly Modified JPMs
- ▶ Alternate Path JPMs

# Exam Outline Quality Checklist

## NUREG-1021 (90d)

- ▶ FORM ES-201-2, Section 3:
  - ES-301-1, Admin JPM criteria
  - ES-301-2, System JPM criteria
  - No tasks duplicated from the audit exam
  - No tasks duplicated on subsequent days during the exam administration

Facility:		Date of Examination:		
Item	Task Description	Initials		
		a	b*	c#
1. W R I T T E N	a. Verify that the outline(s) fit(s) the appropriate model, in accordance with ES-401.			
	b. Assess whether the outline was systematically and randomly prepared in accordance with Section D.1 of ES-401 and whether all K/A categories are appropriately sampled.			
	c. Assess whether the outline over-emphasizes any systems, evolutions, or generic topics.			
	d. Assess whether the justifications for deselected or rejected K/A statements are appropriate.			
2. S I M U L A T O R	a. Using Form ES-301-5, verify that the proposed scenario sets cover the required number of normal evolutions, instrument and component failures, technical specifications, and major transients.			
	b. Assess whether there are enough scenario sets (and spares) to test the projected number and mix of applicants in accordance with the expected crew composition and rotation schedule without compromising exam integrity, and ensure that each applicant can be tested using at least one new or significantly modified scenario, that no scenarios are duplicated from the applicants' audit test(s), and that scenarios will not be repeated on subsequent days.			
	c. To the extent possible, assess whether the outline(s) conform(s) with the qualitative and quantitative criteria specified on Form ES-301-4 and described in Appendix D.			
3. W / T	a. Verify that the systems walk-through outline meets the criteria specified on Form ES-301-2: (1) the outline(s) contain(s) the required number of control room and in-plant tasks distributed among the safety functions as specified on the form (2) task repetition from the last two NRC examinations is within the limits specified on the form (3) no tasks are duplicated from the applicants' audit test(s) (4) the number of new or modified tasks meets or exceeds the minimums specified on the form (5) the number of alternate path, low-power, emergency, and RCA tasks meet the criteria on the form.			
	b. Verify that the administrative outline meets the criteria specified on Form ES-301-1: (1) the tasks are distributed among the topics as specified on the form (2) at least one task is new or significantly modified (3) no more than one task is repeated from the last two NRC licensing examinations			
	c. Determine if there are enough different outlines to test the projected number and mix of applicants and ensure that no items are duplicated on subsequent days.			
4. G E N E R A L	a. Assess whether plant-specific priorities (including PRA and IPE insights) are covered in the appropriate exam sections.			
	b. Assess whether the 10 CFR 55.41/43 and 55.45 sampling is appropriate.			
	c. Ensure that K/A importance ratings (except for plant-specific priorities) are at least 2.5.			
	d. Check for duplication and overlap among exam sections.			
	e. Check the entire exam for balance of coverage.			
	f. Assess whether the exam fits the appropriate job level (RO or SRO).			
a. Author		Printed Name/Signature		Date
b. Facility Reviewer (*)				
c. NRC Chief Examiner (#)				
d. NRC Supervisor				
Note: # Independent NRC reviewer initial items in Column "c"; chief examiner concurrence required. * Not applicable for NRC-prepared examination outlines				

JPM

Requirements

# Proposed Exam Quality Checklist NUREG-1021 (60d)

FORM ES-301-3, Section 2

## Walk-Through Criteria:

- Initial Conditions and Initiating Cues
- References
- Validated Time and Time Critical
- Performance Criteria

Facility:		Date of Examination:		Operating Test Number:	
1. General Criteria		Initials			
		a	b*	c#	
a.	The operating test conforms with the previously approved outline; changes are consistent with sampling requirements (e.g., 10 CFR 55.45, operational importance, safety function distribution).				
b.	There is no day-to-day repetition between this and other operating tests to be administered during this examination.				
c.	The operating test shall not duplicate items from the applicants' audit test(s). (see Section D.1.a.)				
d.	Overlap with the written examination and between different parts of the operating test is within acceptable limits.				
e.	It appears that the operating test will differentiate between competent and less-than-competent applicants at the designated license level.				
2. Walk-Through Criteria		--	--	--	
a.	Each JPM includes the following, as applicable: <ul style="list-style-type: none"> <li>initial conditions</li> <li>initiating cues</li> <li>references and tools, including associated procedures</li> <li>reasonable and validated time limits (average time allowed for completion) and specific designation if deemed to be time-critical by the facility licensee</li> <li>operationally important specific performance criteria that include: <ul style="list-style-type: none"> <li>detailed expected actions with exact criteria and nomenclature</li> <li>system response and other examiner cues</li> <li>statements describing important observations to be made by the applicant</li> <li>criteria for successful completion of the task</li> <li>identification of critical steps and their associated performance standards</li> <li>restrictions on the sequence of steps, if applicable</li> </ul> </li> </ul>				
b.	Ensure that any changes from the previously approved systems and administrative walk-through outlines (Forms ES-301-1 and 2) have not caused the test to deviate from any of the acceptance criteria (e.g., item distribution, bank use, repetition from the last 2 NRC examinations) specified on those forms and Form ES-201-2.				
3. Simulator Criteria		---	---	---	
The associated simulator operating tests (scenario sets) have been reviewed in accordance with Form ES-301-4 and a copy is attached.					
Printed Name / Signature		Date			
a.	Author _____	_____			
b.	Facility Reviewer(*) _____	_____			
c.	NRC Chief Examiner (#) _____	_____			
d.	NRC Supervisor _____	_____			
NOTE: * The facility signature is not applicable for NRC-developed tests. # Independent NRC reviewer initial items in Column "c"; chief examiner concurrence required.					

# ADMINISTRATIVE JPMs

## FORM ES 301–1, Administrative Topics Outline:

- ▶ Admin JPM Criteria:
  - ▶ 1) Direct from bank: RO max 3; SRO and RO Retake max of 4
  - ▶ 2) New or Modified from bank: min of 1
  - ▶ 3) Previous 2 exams: 1 randomly selected

# ADMINISTRATIVE JPMs

## FORM ES 301-1, Administrative Topics Outline

- ▶ Number of ADMIN JPMs
  - RO (4)
  - SROs (5)
  - RO Admin JPM Retake Exam (5)
- ▶ How many JPMs can overlap on SRO / RO?



Facility: _____		Date of Examination: _____
Examination Level: RO <input type="checkbox"/> SRO <input type="checkbox"/>		Operating Test Number: _____
Administrative Topic (see Note)	Type Code*	Describe activity to be performed
Conduct of Operations		
Conduct of Operations		
Equipment Control		
Radiation Control		
Emergency Procedures/Plan		
<p>NOTE: All items (5 total) are required for SROs. RO applicants require only 4 items unless they are retaking only the administrative topics, when all 5 are required.</p>		
<p>* Type Codes &amp; Criteria:</p> <p>(C)ontrol room, (S)imulator, or Class(R)oom  (D)irect from bank (<math>\leq 3</math> for ROs; <math>\leq 4</math> for SROs &amp; RO retakes)  (N)ew or (M)odified from bank (<math>\geq 1</math>)  (P)revious 2 exams (<math>\leq 1</math>; randomly selected)</p>		

# SYSTEM (CR/In-Plant) JPMs

FORM ES 301-2, Control Room Systems

In-plant JPM Outline:

**Criteria (RO/SRO-I/SRO-U):**

(A)Alternate path 4-6/4-6/2-3

(C)Control Room

(D)Direct from bank  $\leq 9 / \leq 8 / \leq 4$

(E)Emergency/Abnormal in-plant  $\geq 1 / \geq 1 / \geq 1$

(EN)ESF  $\geq 1 / \geq 1 / \geq 1$ , including 1A

(L)Low Power or Shutdown  $\geq 1 / \geq 1 / \geq 1$

(N)New or (M)Modified from bank, 1A  $\geq 2 / \geq 2 / \geq 1$

(P)Previous 2 Exams  $\leq 3 / \leq 3 / \leq 2$  randomly selected

(R)RCA  $\geq 1 / \geq 1 / \geq 1$

(S)Simulator

# SYSTEM (CR/In-Plant) JPMs

FORM ES 301-2, Control Room Systems  
In-plant JPM Outline:

Number of System (CR/In-Plant) JPMs:

- RO: 8 cr/3 ip
- SRO-I: 7 cr/3 ip
- SRO-U: 2 cr/3 ip or 3 cr/2 ip

Facility: _____		Date of Examination: _____
Exam Level: RO <input type="checkbox"/> SRO-I <input type="checkbox"/> SRO-U <input type="checkbox"/>		Operating Test No.: _____
Control Room Systems <sup>®</sup> (8 for RO); (7 for SRO-I); (2 or 3 for SRO-U, including 1 ESF)		
System / JPM Title	Type Code	Safety Function
a.		
b.		
c.		
d.		
e.		
f.		
g.		
h.		
In-Plant Systems <sup>®</sup> (3 for RO); (3 for SRO-I); (3 or 2 for SRO-U)		
i.		
j.		
k.		
<sup>®</sup> All RO and SRO-I control room (and in-plant) systems must be different and serve different safety functions; all SRO-U systems must serve different safety functions; in-plant systems and functions may overlap those tested in the control room.		
* Type Codes	Criteria for RO / SRO-I / SRO-U	
(A) alternate path	4-6 / 4-6 / 2-3	
(C) control room	≤ 9 / ≤ 8 / ≤ 4	
(D) direct from bank	≥ 1 / ≥ 1 / ≥ 1	
(E) emergency or abnormal in-plant	- / - / ≥ 1 (control room system)	
(EN) engineered safety feature	≥ 1 / ≥ 1 / ≥ 1	
(L) low-power / shutdown	≥ 2 / ≥ 2 / ≥ 1	
(N) new or (M) modified from bank including 1(A)	≤ 3 / ≤ 3 / ≤ 2 (randomly selected)	
(P) previous 2 exams	≥ 1 / ≥ 1 / ≥ 1	
(R) CA		
(S) simulator		

System JPM Title, short description, KA

Criteria Code

Safety Function

System JPM Criteria

# Little GOTCHAs!!

## ▶ 1) Safety Functions and Systems

- All RO and SRO-I control room (or in-plant) must have different SFs and systems
- In-plant systems and SFs may overlap CR
- All 5 SRO-U system JPMs must have different SFs
- In-Plant JPMs may overlap control room JPM systems and SFs

## ▶ 2) Replacing JPMs

# JPM Developmental Goals

- ▶ Operationally Significant
- ▶ Discriminating
- ▶ Meaningful Performance Requirements
- ▶ Observable Verifiable Actions

# JPM Developmental Goals

“We want JPMs that differentiate between applicants who are competent to safely operate the plant and those who are not.”

# JPM Developmental Goals

Ideally, the applicant:

- ▶ addresses a problem;
- ▶ incorporates a procedure;
- ▶ and performs observable, verifiable actions to accomplish the task or mitigate consequence(s).



# Verifiable Actions

- ▶ The intent of performing a verifiable action is to actually **observe** the applicant perform an action
- ▶ or, in the case of an inplant JPM, to describe exactly what it takes to perform an action.

# Verifiable Actions

## ES-301, Attachment 2:

- ▶ says that an applicant must perform some action that provides insight to the applicant's competence.
- ▶ We are not looking for JPMs that merely require the applicant to identify a malfunction, then inform someone;
- ▶ or only requires the applicant to direct another operator to perform an action or procedure.

# Verifiable Actions?

- ▶ 1) Applicant directs field actions on phone, and observes control room indications?
- ▶ 2) Applicant performs a SDM or leak rate calculation?

# Verifiable Actions

- ▶ unless the applicant actually manipulates some piece of equipment or controls,
- ▶ or performs a meaningful calculation which includes diagnosis of an event or malfunction,
- ▶ then the JPM may not provide a meaningful evaluative tool to grade the individual.

# JPM Critical Step

Procedural Steps Required to Successfully Accomplish *Task*:

- performed correctly;
- performed accurately;
- performed in correct sequence;
- performed at proper time

Critical Steps shall:

- be identified
- have an associated *performance standard*

# Significantly Modified JPMS

## ▶ ES-301 D.2.a.

*A significant modification means that at least one condition has been substantively changed in a manner that alters the course of action of the JPM.*

# Significantly Modified JPMs

- ▶ 1) NON-SIGNIFICANT– Surveillance on a PR NIS channel AND the same surveillance of another PR channel was performed under the same conditions.
- ▶ 2) SIGNIFICANT– Surveillance on a PR NIS channel under different conditions (lower power level, with a failure present, etc.) and the procedural flow path or result is different.

# Alternate Path JPMs–App C

- ▶ Success Path
- ▶ Procedurally Driven
- ▶ Logical Sequence
- ▶ Independent of Crew Dynamics
- ▶ Validated in Advance



# Alternate Path JPMs–App C

## Success Path

- ▶ Analyzing initial conditions to determine an alternative method for completing task
- ▶ or
- ▶ Mitigating system–related problem that occurs during task
- ▶ or
- ▶ Realigning the system

# Alternate Path JPMs

## Procedurally Driven:

- ▶ Procedure has exit step that addresses alternate method to complete task
- ▶ Applicant may use facility practices addressed through generic administrative procedures or policies

# Alternate Path JPMs

## Logical Sequence:

- A malfunction during a SOP operation should not require entering EOP
- Addressing SOP malfunction using ARP or AOP is appropriate

# Alternate Path JPMs

## Independent of Crew Dynamics

- ▶ Complete task or mitigate problem without reliance on other crew actions

# Alternate Path JPMs

- ▶ Validated in Advance:
- ▶ JPM validated in advance of exam
- ▶ JPM not changed during exam

# QUESTIONS?