

IMC 2519 Appendix A

AP 1000 CONSTRUCTION SIGNIFICANCE DETERMINATION PROCESS

1.0 APPLICABILITY

The construction significance determination process (SDP) in this Appendix is designed to provide a means by which NRC inspectors and management can assess the significance of findings identified at facilities for which a limited work authorization (LWA) and/or a combined construction permit and operating license (COL) has been issued authorizing construction activities on a proposed AP 1000 commercial nuclear reactor.

2.0 ENTRY CONDITIONS

Each issue entering the SDP process must first be screened using IMC 0613, Appendix B, "Issue Screening," and IMC 0613, Appendix E, "Examples of Minor Issues."

In rare cases, the construction SDP guidance in this appendix may not be adequate to provide reasonable estimates of the significance of inspection findings within the established SDP timeliness goal of 90 days or less. In this case, the significance determination process using qualitative criteria described in Appendix M will be used.

3.0 DEFINITIONS

Within this SDP, the following definitions apply:

- A. Finding – A performance deficiency of more than minor significance. A finding may or may not be associated with regulatory non-compliance and, therefore, may or may not result in a violation.
- B. Programmatic finding – A finding involving inadequate requirements intended to ensure a critical attribute of a construction or operational program is met.
- C. ITAAC finding – A technical finding that is associated with a specific ITAAC and is material to the ITAAC acceptance criteria.
- D. Construction finding – A technical finding that is not associated with a specific ITAAC and/or is not material to the ITAAC acceptance criteria.
- E. Technical finding – A finding that is not a programmatic finding. Construction findings and ITAAC findings are examples of technical findings.

- F. Program critical attribute – An element of a program that is established to ensure that a program objective and/or a regulatory requirement is met.
- G. Work activities – Processes implemented during the construction of the facility in areas such as but not limited to structural, piping, electrical, and foundations.
- H. Material affect – Having a logical connection and relevant to the matters under consideration.

4.0. AP 1000 CONSTRUCTION SIGNIFICANCE DETERMINATION PROCESS

The inspector will first determine if the finding is programmatic in nature. The flow diagram in Sheet 1 is provided for guidance through the process.

- Step 1. Determine the type of finding that has been identified.
 - a. If the finding is associated only with program requirements and there is no technical issue involved, it is a programmatic finding. Proceed to Step 2.
 - b. If the finding is associated with a specific ITAAC and is material to the ITAAC acceptance criteria, it is an ITAAC finding. Proceed to Step 4.
 - c. If the finding is not associated with a specific ITAAC and/or is not material to the ITAAC acceptance criteria, it is a construction finding. Proceed to Step 4.
- Step 2. Determine if the finding is an omission of a program's critical attribute.
 - a. If the finding is an omission of a program's critical attribute, go to step 3.
 - b. If the finding is not an omission of a program's critical attribute, then the significance of the finding is GREEN.
- Step 3. Determine if the omission of the program's critical attribute was identified by the NRC during a previous inspection of the respective program.
 - a. If the omission was identified by the NRC during a previous inspection and the licensee has had adequate time to address the issue, the significance of the finding is WHITE.

- b. If the omission was not previously identified by the NRC or the licensee has not had adequate time to address the finding, then the significance of the finding is GREEN.

Step 4. Determine if the finding is related to security.

- a. If the finding is related to security either during construction (i.e., fitness-for duty, control of safeguards information) or after the operational security program has been implemented, go to the Baseline Security SDP in IMC 0609, Appendix E, Part 1.
- b. If the finding is not related to security, then go to step 5.

Step 5. Determine if the finding is associated with an operational program after a license condition implementation milestone has occurred.

- a. If the operational program implementation milestone has been reached, go to the appropriate ROP SDP in IMC 0609.
- b. If the finding is not related to an operational program after the program implementation milestone has been met, go to Step 6.

NOTE: Once the inspector gets to this step in the SDP, the finding has been determined to be either related to security construction or operational programs, or the finding has been determined to be a technical finding (i.e., a construction finding or an ITAAC finding). Construction findings and ITAAC findings will be assigned to a coordinate in the construction significance determination matrix based on the pre-determined risk of the involved system or structure (x-axis) and the row that applies to the quality of construction (y-axis) of the finding. The matrix and associated guidance is provided in Sheet 2 to assist inspectors in determining the significance of the technical finding that has been identified.

Step 6. Determine if the finding can be associated with a system or structure.

- a. If the finding can be associated with a system or structure, proceed to Step 7.
- b. If the finding cannot be associated with a system or structure, the significance of the finding is GREEN.

Step 7. Determine the appropriate column to which the finding should be assigned based on the guidance provided in Sheet 2 and the following steps.

- a. If the risk importance of the system or structure involved with the finding is determined to be very low, the finding is not assigned to a

column in the construction SDP matrix and the significance of the finding is GREEN.

- b. If the risk importance of the system or structure involved with the finding is determined to be low, the finding is assigned to Column 1.
- c. If the risk importance of the system or structure involved with the finding is determined to be intermediate, the finding is assigned to Column 2.
- d. If the risk importance of the system or structure involved with the finding is determined to be high, the finding is assigned to Column 3.

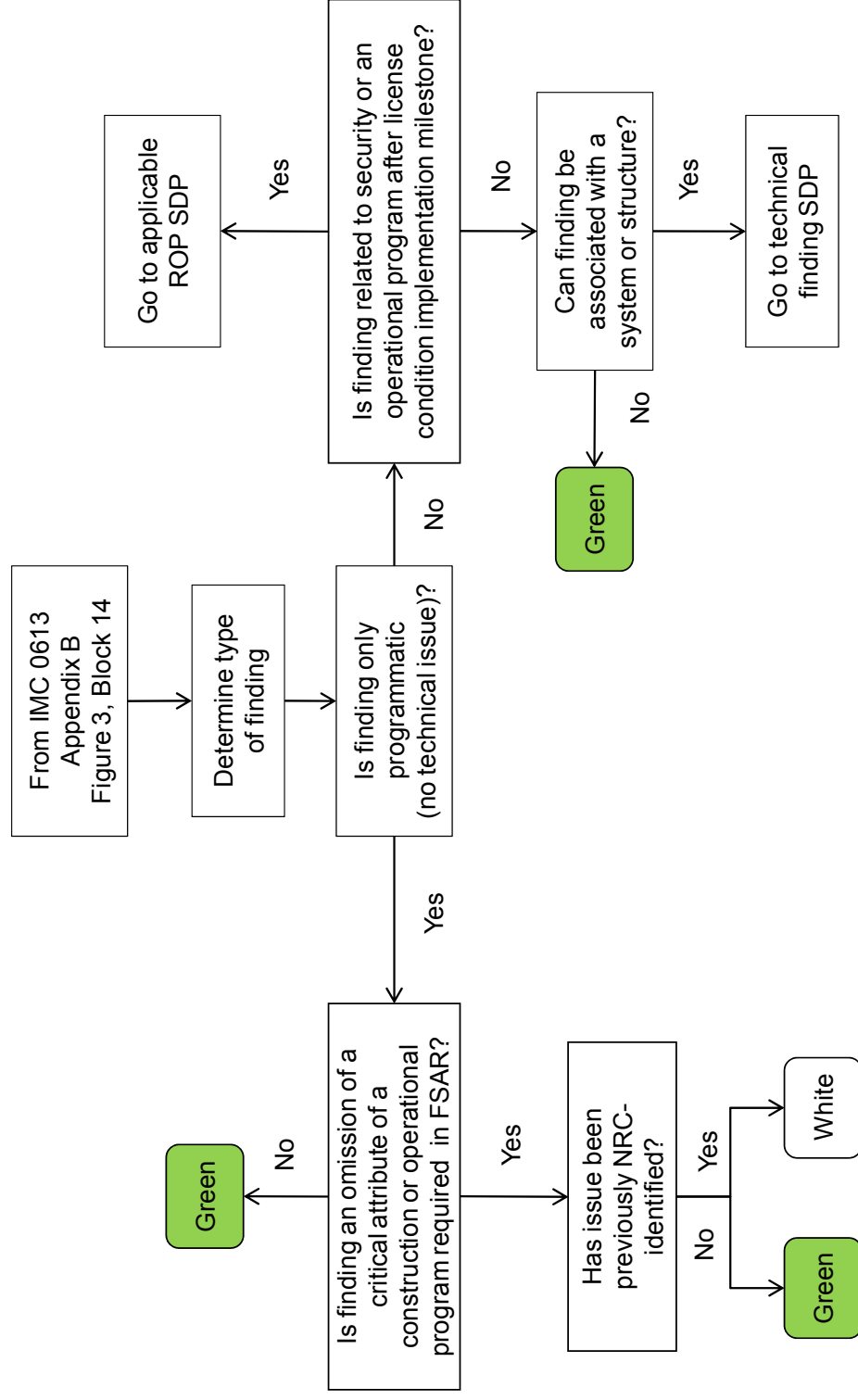
Step 8. Determine the appropriate row to which the finding should be assigned.

- a. If the finding involves only one work activity on one system or structure, or the finding does not materially affect a system or structure, the finding is assigned to Row 1. This performance deficiency can entail the failure to meet regulatory requirements, including one or more QA criteria that have more than minor safety or security significance; a failure to establish, maintain, or implement adequate controls over procurement, construction, examination, or testing processes that are important to safety; a failure to adequately implement QA/QC processes or procedures; or a limited failure to maintain QA/QC records to demonstrate the adequacy of construction.
- b. If the finding involves multiple work activities that materially affect one system or structure, or if the finding involves one work activity that materially affects multiple systems or structures, the finding is assigned to Row 2. This performance deficiency can entail deficient construction or construction of unknown quality involving either a single work activity on multiple systems and/or structures; multiple work activities on a single system and/or structure; or the failure to maintain QA/QC records for multiple work activities on an entire system or structure or for one work activity on multiple systems or structures.
- c. If the finding involves multiple work activities that materially affect multiple systems or structures, the finding is assigned to Row 3. This performance deficiency entails deficient construction or construction of unknown quality across multiple work activities on multiple systems and/or structures; or the failure to maintain QA/QC records for multiple work activities on multiple systems or structures.
- d. If the licensee has submitted an ITAAC closure letter to the NRC for an ITAAC that is associated with the system or structure and/or the NRC has identified that the finding is a repetitive significant condition

adverse to quality, the finding will be assigned to the next highest row in the matrix.

- Step 9. Determine the significance of the finding based on the results of Steps 7 and 8.
- a. Findings in Row 1 have a significance of GREEN.
 - b. Findings in Row 2, Columns 1 and 2 have a significance of GREEN.
 - c. Findings in Row 2, Column 3 have a significance of WHITE.
 - d. Findings in Row 3, Column 1 have a significance of GREEN.
 - e. Findings in Row 3, Column 2 have a significance of WHITE.
 - f. Findings in Row 3, Column 3 have a significance of YELLOW.
 - g. Findings in Row 4, Column 1 have a significance of WHITE.
 - h. Findings in Row 4, Column 2 have a significance of YELLOW.
 - i. Findings in Row 4, Column 3 have a significance of RED.

Sheet 1: Construction Programmatic SDP



SHEET 2: Construction Technical Finding SDP

AP 1000 Construction Significance Determination Matrix				
Quality of Construction	Row 4			
	Row 3			
	Row 2			
	Row 1			
		Column 1	Column 2	Column 3
System/Structure Risk Importance				

RISK IMPORTANCE TABLE FOR AP1000

SYSTEMS			
VERY LOW	LOW	INTERMEDIATE	HIGH
ALL OTHER SYSTEMS: SFS, SGS, ETC...	PXS (ACC)	PXS (CMT)	PMS
	DAS	PXS (PRHR)	IDS
	ECS	PLS	PXS (IRWST)
	CNS (ISOLATION)	EDS	RCS
	PCS		
	RNS		
	CCS		
	SWS		
	VLS		
	ECS (ANC DIESELS)		
	PXS (IVR)		
	VBS (FANS)		
STRUCTURES			
VERY LOW	LOW	INTERMEDIATE	HIGH
TURBINE BUILDING	ANNEX BUILDING	CONTAINMENT	
EDG BUILDING		SHIELD BUILDING	
RAD WASTE BUILDING		AUXILIARY BUILDING	
YARD, SITE GRADE		NUCLEAR ISLAND BASEMAT	
NON 1E CABLE RACEWAYS		1E CABLE RACEWAYS	

Note: To ensure consistency, systems are listed using their official three letter designation from the AP1000 DCD, Tier 1, Introduction, page 1.4-1. Using this convention, the RCS includes the automatic depressurization system (ADS). Some systems were split into smaller segments:

PXS (ACC): Accumulators

PXS (CMT): Core makeup tanks

PXS (PRHR): Passive RHR

PXS (IRWST): In-containment refueling water storage tank

CNS (ISOLATION): Containment isolation valves

ECS (ANC DIESELS): Ancillary diesel generators

PXS (IVR): Features of the PXS related to in-vessel retention of molten core
VBS (FANS): Main control room and I&C rooms B/C ancillary fans

When spacing requirements are specified for more than one structure, the importance of the more important structure is used. For example, a finding related to inadequate spacing between the turbine building and the aux building would be placed in the intermediate column.

Systems were placed into columns based on their RAW values as determined by SPAR model calculations and input from Westinghouse PRA staff. The D-RAP list (DCD, Tier 1, Table 17.4-1) was reviewed to determine if additional placement criteria should be considered. Some systems were assigned a risk importance designation based on the following criteria:

1. System performs a post-72 hour safety function
2. System is safety significant during shutdown operations
3. System is important to LERF
4. System is important during a severe accident

Structures were assigned to risk importance columns based on the review of the equipment contained within them and the judgment that the risk importances should be comparable. Reactor coolant system (RCS) piping and components were assigned to the high risk significance column due to the role they play in maintaining pressure boundary and preventing coolant system leakage. The RCS includes the pressure boundary components and pipe segments that must meet ASME Section III requirements. They are identified by DCD Tier 1, Tables 2.1.2-1 and 2.1.2-2 respectively.

Restraints and supports (e.g., pipe hangers, snubbers) will be considered part of the system to which they are attached.

Embedded plates will be considered part of the structure to which they are attached.

Sensors will be classified according to their DCD tag numbers. For example, the RCS hot leg 1 flow sensors have tags RCS-101A/B/C/D. They will be considered part of the RCS. It is recognized that some sensors may provide input to a function (e.g. trip, control) with a higher or lower risk significance than the system where the sensor is physically located. These sensors may be moved to a different column based on a technical justification.

Revision History Page

Commitment Tracking Number	Issue Date	Description of Change	Training Needed	Training Completion Date	Comment Resolution Accession Number
	Xx/xx/xx	<p>This manual chapter supports the Construction Reactor Oversight Process for significance determination of findings. The significance determination process detailed in the manual chapter is designed to characterize the significance of inspection findings for the NRC licensee performance assessment process using risk insights, as appropriate.</p>	Yes	12/31/2011	N/A