Emergency Planning Inspections, Tests, Analyses and Acceptance Criteria (ITAAC) Workshop

Joseph Sebrosky,
New, Research and Test Reactors
Bruce Musico,
Emergency Preparedness Project Office
April 27, 2004

1

Emergency Planning ITAAC Workshop

- 10 CFR Part 52 and ITAAC Basic Principles
- Emergency Planning ITAAC

2

Licensing under 10 CFR Part 50

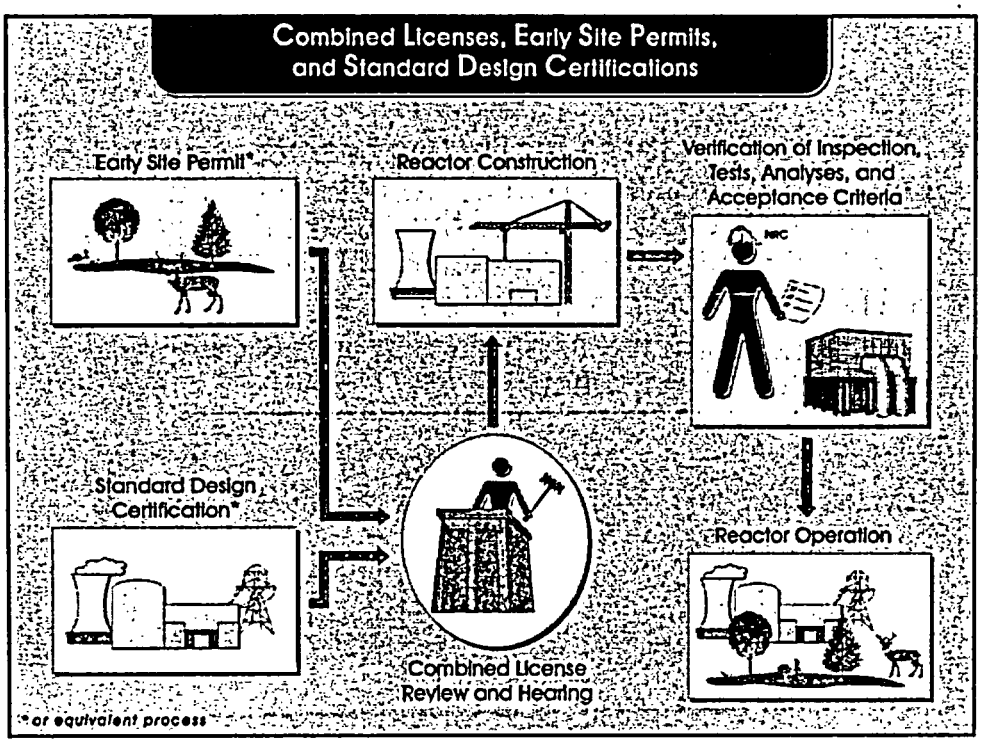
- Lack of finality at construction permit stage
- Construction delay and rework because of design and regulatory changes
- Final safety decisions not made until plant is nearly complete and most costs expended
- Public participation difficult

3

Part 52 Licensing Process

- Stable and predictable licensing process
- Resolve safety and environmental issues before authorizing construction
- Final safety analysis report complete prior to starting construction
- Timely and meaningful public participation
- Enhance safety and reliability through standardization of nuclear plant designs
- Reduce financial risks to licensees (COL)
- Resolves inspection requirements and acceptance criteria (ITAAC) prior to authorization of construction

4



Combined License (COL)

- Combined construction-permit-and operating license with conditions for a nuclear power plant
- 40 year duration
- COL may reference an ESP, a standard design certification, both, or neither
- A COL is the fundamental licensing process in Part 52 for reducing regulatory uncertainties

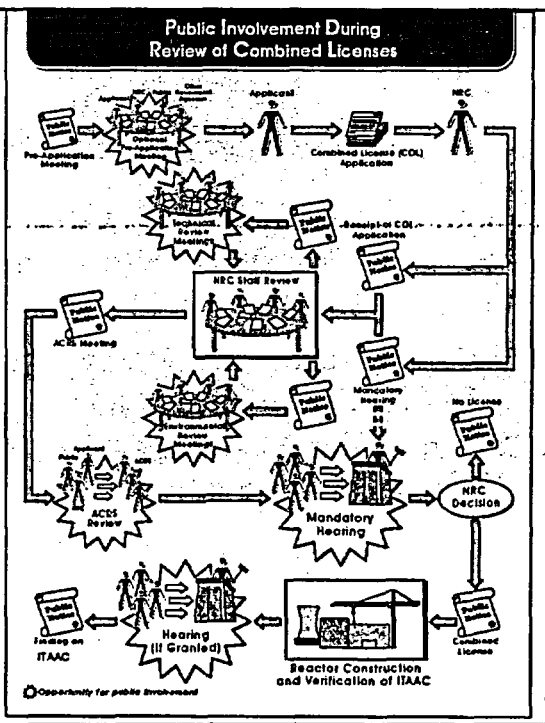
6

Combined License - ITAAC

- ITAAC verify that the facility has been constructed and will be operated in conformity with the license, the provisions of the Atomic Energy Act, and the Commission's rules and regulations
- ITAAC met prior to fuel load
- Hearing opportunity after plant is built is on whether ITAAC are met

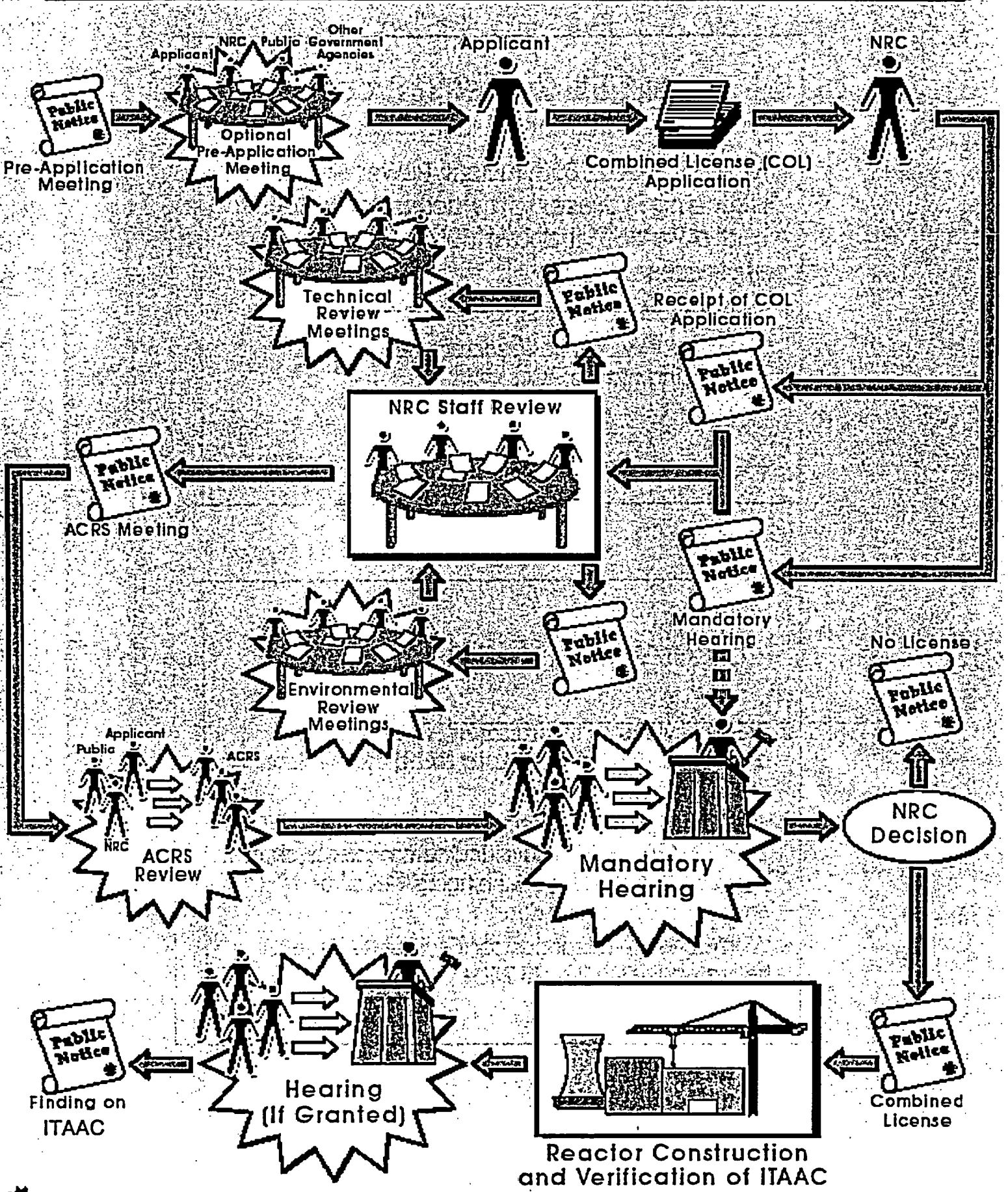
7

Combined License Overview



8

Public Involvement During Review of Combined Licenses



Opportunity for public involvement

Part 52 Licensing Process
Additional Information

- NUREG/BR-0298, "Nuclear Power Plant Licensing Process," provides an overview of the Part 50 and Part 52 licensing processes
- New Reactor Licensing website
  - http://www.nrc.gov/reactors/new-reactor-licensing.html

9

Emergency Planning ITAAC

- Staff provided draft proposed emergency planning ITAAC in a letter to NEI dated January 29, 2004
- Federal Register Notice issued on March 10, 2004 (69 FR 11464) soliciting comments on draft proposed emergency planning ITAAC and announcing workshop
- Written comment period for Federal Register notice ends May 27, 2004

10

Emergency Planning – NRC Requirements

- 10 CFR 50.47 – Provides the 16 emergency planning standards
- Appendix E to 10 CFR Part 50 – Provides the minimum EP requirements
- 10 CFR Part 50 Licensing Process – Various EP issues are resolved late in the licensing process
- 10 CFR Part 52 – Allows for meaningful public involvement and resolution of EP issues at the beginning of the licensing process

11

Emergency Planning – Background

- SECY-95-090, "Emergency Planning Under 10 CFR Part 52," April 11, 1995
- The principal combined license (COL) EP issues are the form and role of ITAAC, and the treatment of pre-operational emergency preparedness exercises.
- ITAAC are to be necessary and sufficient to demonstrate compliance with the 16 emergency planning standards in 10 CFR 50.47(b). [per SECY-95-090]

12

Emergency Planning – SECY-95-090

- Appendix E requires that a full-participation emergency preparedness exercise be conducted within 2 years before the first reactor unit at a site is authorized to operate above 5 percent of rated power
- NRC will ensure that ITAAC applicable to onsite (licensee) EP are satisfied
- FEMA will ensure that ITAAC applicable to offsite (State, tribal & local) EP are satisfied

13

Emergency Planning – SECY-95-090 (cont.)

- ITAAC allow the making of a predictive regulatory finding of reasonable assurance that adequate protective measures can and will be taken in the event of a radiological emergency before plant features required for emergency response are completed
- The acceptance criteria will be based on the evaluation criteria in NUREG-0654/FEMA-REP-1, Rev. 1 (Nov. 1980) – "Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants" [Evaluation Criteria – 16 planning standards]
- NRC & FEMA staffs are seeking stakeholder input into the process of developing the criteria to evaluate EP ITAAC.

14

Emergency Planning – Requirements

- 10 CFR 52.79 – Contents of applications; technical information
- 52.79 (c) – The application for a combined license must include the proposed inspections, tests and analyses, including those applicable to emergency planning
- 52.79 (d) – The application must contain emergency plans which provide reasonable assurance that adequate protective measures can and will be taken in the event of a radiological emergency at the site.

15

Emergency Planning – Commission Direction

- SECY-02-0067, "Inspections, Tests, Analyses, and Acceptance Criteria (ITAAC) for Operational Programs (Programmatic ITAAC)," April 15, 2002
- SRM (Staff Requirements Memorandum) – ITAAC should encompass only those matters that, by their nature, cannot be resolved prior to construction
- The NRC inspection process does not replace a particular ITAAC
- NRC staff should interact with stakeholders to identify those issue that are material to the Commission making a *reasonable assurance* finding at the COL stage.

16

Emergency Planning – Screening Criteria

- *Energy Policy Act of 1992* – ITAAC that are necessary and sufficient to provide reasonable assurance that the facility has been constructed and will be operated in conformity with the license
- SECY-95-090 & 10 CFR 52.79(d) – ITAAC enable the NRC to make a predictive regulatory finding of reasonable assurance that adequate protective measures can and will be taken in the event of a radiological emergency
- SRM SECY-02-0067 – ITAAC should encompass only those matters that, by their nature, cannot be resolved prior to construction
- Comprehensive EP ITAAC – In general, the proposed EP ITAAC comprise those aspects of emergency planning that would reasonably NOT be available prior to construction on a so-called greenfield site (e.g., siren systems).

17

Emergency Planning – Staff Proposed EP ITAAC (01/29/04)

- Program Requirements – 15 of the 16 emergency planning standards from 10 CFR 50.47(b) [Recovery and Reentry Planning and Post-Accident Operations not included]
- Inspections, Tests, Analyses (ITAs) – General verification methods; specific to proposed reactor design
- Acceptance Criteria – Self-evident & objective variations of NUREG-0654 evaluation criteria
  - Allows applicant to propose ITAACs for up to 116 of the 282 evaluation criteria in NUREG-0654
  - Applicant would determine the actual number of ITAAC
  - Evaluation criteria that are not fully resolved in emergency plans submitted with the COL would have associated ITAAC provided in application

18

Emergency Planning – Staff Proposed EP ITAAC (01/29/04)

- Proposed EP ITAAC assumes State & local government participation
- 10 CFR 50.47(c)(1)–NRC's so-called "realism rule" – Reflected in Supp. 1 to NUREG-0654/FEMA-REP-1, "Criteria for Utility Offsite Planning and Preparedness"
- Concurrent Completion of EP ITAAC – completion & NRC verification in any order
- NRC Verification, and FEMA Findings & Determinations
- Includes an EP Exercise

19

Emergency Planning – Exercise Requirements

- Full-participation Exercise – Within 2 years before the issuance of the first operating license for the first reactor at the site, which tests as much of the licensee, State and local emergency plans as is reasonably achievable without mandatory public participation. (Section IV.F.2.a, Appendix E of 10 CFR Part 50)
- Biennial Exercise – Subsequent to the initial exercise, each site shall conduct biennial exercises of both onsite & offsite emergency plans (Section IV.F.2.b & c, App. E)
- EP Exercises – (1) test the adequacy of timing and content of implementing procedures & methods; (2) test emergency equipment, communication networks, and public notification systems; and (3) ensure that emergency response personnel are familiar with their duties (Section IV.F.2)
- Existing reactor site – The proposed (COL) emergency plans could be tested in a biennial exercise, as part of the ITAAC verification process

20

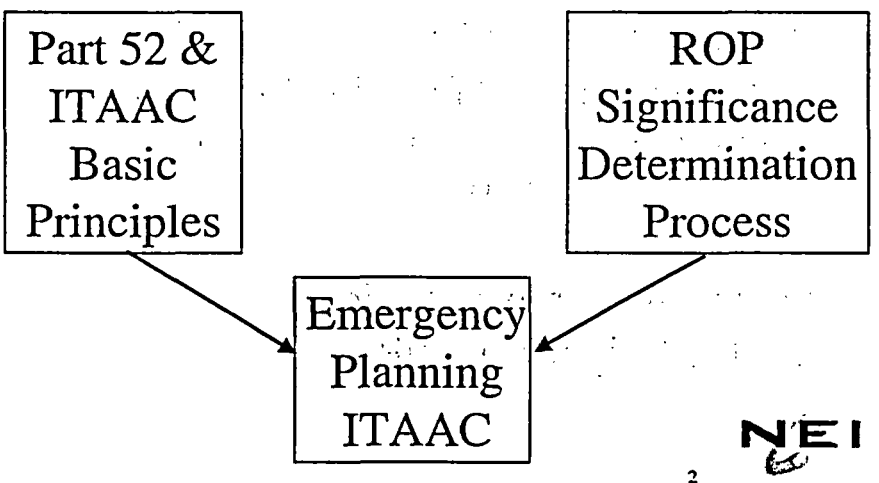
Emergency Planning ITAAC

Industry Proposal for Discussion

NRC Workshop
April 27, 2004

NEI

Industry Approach



NEI

Key Part 52 & ITAAC Principles

- Part 52 requires ITAAC on EP but does not specify their scope or content
- ITAAC focus on top-level requirements, i.e., significant design or performance elements
- ITAAC are performed by the licensee and verified by the NRC staff
- Part 50 and other NRC requirements, including EP requirements, apply to Part 52 applicants and licensees

NEI

Significance Determination Process

- Reactor Oversight Program identified risk significant EP Planning Standards
  - NRC Inspection Manual Chapter 0609, Appendix B (EP SDP)
- Subject matter experts identified the most risk significant EP elements

NEI

Risk-Significant EP Standards

- §50.47(b)(4) Emergency classification system
- §50.47(b)(5) Public alert and notification system
- §50.47(b)(9) Accident assessment
- §50.47(b)(10) Protective response

All 16 planning standards remain subject to normal NRC and/or FEMA inspection

NEI

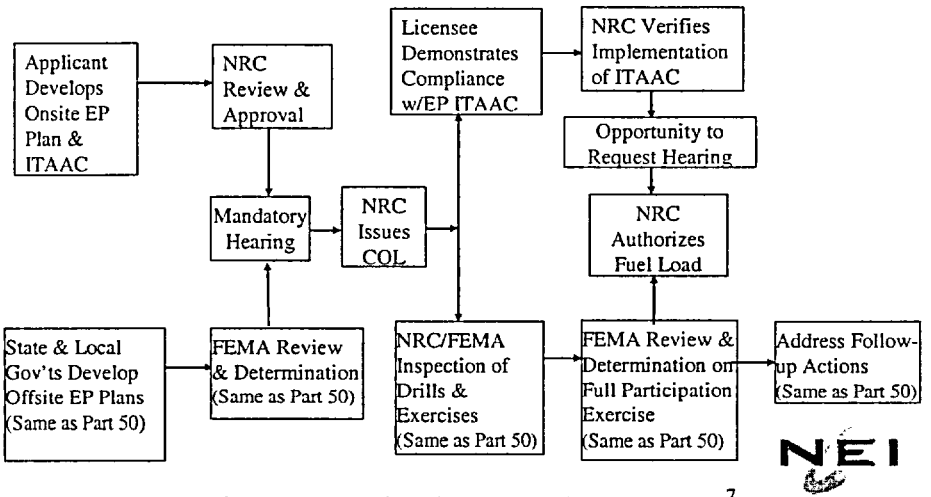
Key Differences From NRC Approach

- EP ITAAC correspond to risk-significant planning standards (plus EP-related ITAAC from a referenced design certification, if any)
  - No EP ITAAC on planning standards that are not risk-significant
  - ITAAC focus on on-site EP and off-site interfaces

FEMA continues to perform all its normal evaluations and functions

NEI

PART 52 PROCESS FOR EMERGENCY PLANNING



Note – A person may raise a concern any time after the COL is issued under normal NRC procedures.

Advantages of Industry Approach

- Consistent with key principles underlying ITAAC
  - ITAAC focused on significant EP elements
- Preserves FEMA's traditional role
- Preserves the roles of State and Local governments

Strawman EP ITAAC For Discussion

NEI

Risk-Informed Industry Approach to Emergency Planning ITAAC
For Discussion During April 27, 2004, NRC Workshop

In addition to the approach to Emergency Planning (EP) ITAAC proposed by the NRC staff in its letter dated January 29, 2004, we plan to put forward for discussion a risk-informed alternative approach. Consistent with a key principle underlying all ITAAC, the approach would establish ITAAC on top-level EP requirements only, determined based on risk-significance. Other EP program elements would be evaluated under NRC's ongoing construction inspection program or operational readiness review, with input from FEMA as appropriate.

EP planning standards are codified in 10 CFR 50.47(b), and supporting requirements exist in 10 CFR Part 50, Appendix E. EP planning standards have been evaluated for risk-significance in the significance determination process. The risk-significant EP program elements are a subset of the EP planning standards and supporting requirements. A loss of function of a risk-significant planning standard (RSPS) has greater safety significance than would a loss of function of the other planning standards. As such, it is appropriate for EP ITAAC to focus on the risk-significant planning standards.

As identified in NRC IMC-0609, the risk stratification of the planning standards in 10 CFR 50.47(b) and the supporting requirements in Part 50, Appendix E is as follows:

- RSPS 10 CFR 50.47(b)(4), (5), (9), and (10) and related sections of Part 50, Appendix E
- PS 10 CFR 50.47(b)(1), (2), (3), (6), (7), (8), (11), (12), (13), (14), (15), and (16) and related sections of Appendix E to 10 CFR Part 50
- Other EP-related regulations, including various sections of Appendix E not identified in the specific PS sections; 10 CFR 50.54(q), 50.54(t), or 50.72; the Emergency Plan; and other regulatory commitments

Accordingly, the risk-informed alternative approach to Emergency Planning ITAAC is based on the NUREG-0654/FEMA-REP-1 evaluation criteria associated with the RSPS, i.e., EP program elements D, E and I, and the elements of J integral to the protection of public health and safety.

Attached is a strawman set of EP ITAAC that illustrate the sort of ITAAC that result under the approach outlined above. We expect that certain EP ITAAC would be completed before the full scale exercise, while others will necessarily be completed in connection with performance of the exercise. The strawman EP ITAAC are provided for illustration purposes and as basis for further discussion of this important issue.

NEI - April 27, 2004

Table X.XX, Emergency Planning Inspections, Tests, Analyses, and Acceptance Criteria			
Risk Significant Planning Standard	EP Program Element(s)	Inspections, Tests, Analyses	Acceptance Criteria
A: Emergency Classification System: [10 CFR 50.47(b)(4)] A standard emergency classification and action level scheme, the bases of which include facility system and effluent parameters, is in use by the nuclear facility licensee, and state and local response plans call for reliance on information provided by facility licensees for determinations of minimum initial offsite response measures.	A.1 The emergency classification and emergency action level (EAL) scheme identifies facility system and effluent parameters constituting the bases for the classification scheme.	A test will be performed of the facility system and effluent parameters specified in the EAL scheme.	The facility systems specified in the EALs are installed and the system and effluent parameters are retrievable in the main control room (MCR) and technical support center (TSC).

Table X.XX, Emergency Planning Inspections, Tests, Analyses, and Acceptance Criteria			
Risk Significant Planning Standard	EP Program Element(s)	Inspections, Tests, Analyses	Acceptance Criteria
B: Notification Methods and Procedures [10 CFR 50.47(b)(5)] Procedures have been established for notification, by the licensee, of state and local response organizations and for notification of emergency personnel by all organizations; the content of initial and follow-up messages to response organizations and the public has been established; and means to provide early notification and clear instruction to the populace within the plume exposure pathway EPZ have been established.	B.1 Means will be provided to alert, notify, and mobilize emergency response personnel.	A test will be performed of the means of alerting, notifying, and mobilizing emergency response personnel.	Emergency response personnel receive the alert, notification, and mobilization communication.
	B.2 Capability will be provided to notify responsible state and local governmental agencies within 15 minutes after declaring an emergency.	A test will be performed of the capability to notify responsible state and local governmental agencies.	The responsible state and local governmental agencies receive notification within 15 minutes after declaring a simulated emergency.
	The following ITAAC would be used if an existing E-plan is <u>not</u> referenced		
	B.3 Physical means and procedures will be provided for alerting and providing prompt instructions to the public within the plume exposure pathway EPZ.	A test will be performed of physical means and procedures for alerting and providing prompt instructions to the public within the plume exposure pathway EPZ.	The following physical means and procedures exist and provide for alerting and providing prompt instructions to the public within the plume exposure pathway EPZ: *[The COL applicant will identify the specific physical means and procedures.]*

Table X.XX, Emergency Planning Inspections, Tests, Analyses, and Acceptance Criteria			
Risk Significant Planning Standard	EP Program Element(s)	Inspections, Tests, Analyses	Acceptance Criteria
C. Accident Assessment **10 CFR 50.47(b)(9)** Adequate methods, systems, and equipment for assessing and monitoring actual or potential offsite consequences of a radiological emergency condition are in use.	C.1 Onsite capability and resources will be provided to provide initial and continuing radiological assessment.	A test will be performed of the onsite capability and resources for initial and continuing radiological assessment throughout the course of an accident.	The following onsite capability and resources exist and provide for initial and continuing radiological assessment exist: *[The COL applicant will identify the specific capability and resources.]*
	C.2 Methods and techniques will be provided for determining the source term of releases of radioactive material within plant systems, and the magnitude of the release of radioactive materials based on plant system parameters and effluent monitors.	A test will be performed of methods and techniques for determining the source term of releases of radioactive material within plant systems, and the magnitude of the release of radioactive materials based on plant system parameters and effluent monitors.	The following methods and techniques exist and provide for determining the source term of releases of radioactive material within plant systems, and the magnitude of the release of radioactive materials: [*The COL applicant will identify the specific methods and techniques.*]

Table X.XX, Emergency Planning Inspections, Tests, Analyses, and Acceptance Criteria			
Risk Significant Planning Standard	EP Program Element(s)	Inspections, Tests, Analyses	Acceptance Criteria
C. Accident Assessment **10 CFR 50.47(b)(9)** Adequate methods, systems, and equipment for assessing and monitoring actual or potential offsite consequences of a radiological emergency condition are in use.	C.3 Equipment will be provided to continuously assess the impact of the release of radioactive materials to the environment accounting for the relationship between effluent monitor readings, and onsite and offsite exposures and contamination for various meteorological conditions.	A test will be performed of equipment provided for continuously assessing the impact of a release of radioactive materials to the environment accounting for the relationship between effluent monitor readings, and onsite and offsite exposures and contamination for various meteorological conditions.	The following equipment exists and provides for continuously assessing the impact of a release of radioactive materials to the environment: [*The COL applicant will identify the specific equipment.*]
	C.4 Capability of acquiring and evaluating meteorological information will be provided.	A test will be performed of the capability for acquiring and evaluating meteorological information.	The following capability exists and provides for acquiring and evaluating meteorological information: *[The COL applicant will identify the specific capability.]*

Table X.XX, Emergency Planning Inspections, Tests, Analyses, and Acceptance Criteria			
Risk Significant Planning Standard	EP Program Element(s)	Inspections, Tests, Analyses	Acceptance Criteria
C. Accident Assessment **10 CFR 50.47(b)(9)** Adequate methods, systems, and equipment for assessing and monitoring actual or potential offsite consequences of a radiological emergency condition are in use.	C.5 Methods, expertise and equipment to make rapid assessments of the actual or potential magnitude and locations of radiological hazards through liquid or gaseous release pathways will be provided, including activation, field team composition, and estimated deployment times, notification means, transportation, communication, and monitoring equipment.	A test will be performed of methods, expertise and equipment for making rapid assessments of the actual or potential magnitude and locations of radiological hazards through liquid or gaseous release pathways, including activation, field team composition, and estimated deployment times, notification means, transportation, communication, and monitoring equipment.	The following methods, expertise and equipment exist and provide for making rapid assessments of the actual or potential magnitude and locations of radiological hazards through liquid or gaseous release pathways: [*The COL applicant will identify the specific methods, expertise and equipment.*]
	C.6 The capability and resources will be provided to detect and measure radioiodine concentrations in air in the plume exposure EPZ, as low as 10^{-7} μCi/cc (microcuries per cubic centimeter) under field conditions.	A test will be performed of the capability and resources for detecting and measuring radioiodine concentrations in air in the plume exposure EPZ, as low as 10^{-7} μCi/cc under field conditions.	The following capability and resources exist and detect radioiodine concentrations in air in the plume exposure EPZ, as low as 10^{-7} μCi/cc: [*The COL applicant will identify the specific* capability and resources.]

Table X.XX, Emergency Planning Inspections, Tests, Analyses, and Acceptance Criteria			
Risk Significant Planning Standard	EP Program Element(s)	Inspections, Tests, Analyses	Acceptance Criteria
C. Accident Assessment **10 CFR 50.47(b)(9)** Adequate methods, systems, and equipment for assessing and monitoring actual or potential offsite consequences of a radiological emergency condition are in use.	C.7 Methods and equipment will be provided for estimating integrated dose from the projected and actual dose rates, and for comparing these estimates with the protective action guides (PAGs).	A test will be performed of methods and equipment for estimating integrated dose from projected and actual dose rates, and for comparing these estimates with the PAGs	The following methods and equipment exist and provide for estimating integrated dose from projected and actual dose rates, and for comparing these estimates with the PAGs exist: [*The COL applicant will identify the specific* methods and equipment.]

Table X.XX, Emergency Planning Inspections, Tests, Analyses, and Acceptance Criteria			
Risk Significant Planning Standard	EP Program Element(s)	Inspections, Tests, Analyses	Acceptance Criteria
D. Protective Response **10 CFR 50.47(b)(10)** A range of protective actions has been developed for the plume exposure pathway EPZ for emergency workers and the public. In developing this range of actions, consideration has been given to evacuation, sheltering, and, as a supplement to these, the prophylactic use of potassium iodide (KI), as appropriate. Guidelines for the choice of protective actions during an emergency, consistent with federal guidance, are developed and in place, and protective actions for the ingestion exposure pathway EPZ appropriate to the locale have been developed.	D.1 Means will be provided to warn or advise onsite individuals of an emergency, including those in areas controlled by the operator, including: a. employees not having emergency assignments; b. visitors; c. contractor and construction personnel; and d. other persons who may be in the public access areas on or passing through the site or within the owner controlled area.	A test will be performed of means for warning or advising onsite individuals of an emergency.	The facility systems for warning or advising onsite individuals of an emergency are operable.