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September 25, 1992

Re: Indian Point Unit No. 2
Docket No. 50-247

Document Control Desk
US Nuclear Regulatory Commission
Mail Station P1-137
Washington, DC 20555

SUBJECT: Emergency Action Level Classification

This letter and attachments are in response to the telephone conversations of September 17, 1992 and September 18, 1992 between Messrs. Cooper and Nicholson (et al) of the NRC and Messrs. Bram and Quinn (et al) of Con Edison.

Should you have any questions regarding this matter, please contact Mr. Charles W. Jackson, Manager, Nuclear Safety and Licensing.

Very truly yours,

Attachments

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ATTACHMENT A

ADMINISTRATIVE CONTROL CHANGES

CONSOLIDATED EDISON COMPANY OF NEW YORK, INC.
INDIAN POINT UNIT NO. 2
DOCKET NO. 50-247
SEPTEMBER, 1992

ACTIONS TAKEN PURSUANT TO NRC REQUEST

1. Emergency Procedures Book #1 has been revised by incorporation of IAP-10 Rev. 8 which requires staffing levels at an NUE declaration in anticipation of possible upgraded declarations.

2. Emergency Procedures Book #2 has been revised by incorporation of the following procedure changes.

   (a) IP 1001 Rev. 5 - Provides for increased staffing levels of the onsite emergency organization commensurate with the declaration of certain NUEs.

   (b) IP 1002 Rev. 13 - In the event of an NUE declaration due to primary to secondary leakage exceeding Technical Specification limits associated with a Steam Generator tube rupture, provides for a recommendation to the NRC that a staffing level equivalent to an alert declaration be instituted. Similarly, NYS and the counties are recommended to man to the next higher staffing level.

   (c) Form 45A, dated September 21, 1992, provides instructions to the Communicator to initiate a call in of personnel per IP-1002 Rev. 13.

   (d) The index of Implementation Procedure IP-1 has been revised to reflect the above procedure revisions.

   (e) Similarly Appendix D was revised to reflect the effective dates of forms discussed above.

On September 17, 1992, by temporary procedure change, the IAP-10 and IP-1002 procedure changes were implemented. Watch personnel were provided guidance on the changes as they assumed shift duties. On September 21, 1992 the procedure changes were formally amended and issued.

On September 17, 1992 the Counties of Westchester, Orange, Rockland, Dutchess and Putnam were notified via their Emergency Management Offices of the procedure revisions by phone subsequent to the initial NRC telephone call. In a similar manner, New York State was also notified. In all instances, State and County officials understood and agreed to the procedure revisions prior to the procedure changes being implemented on site.

ATTACHMENT B

# EVALUATION OF NUREG-0654 REV 1 APPENDIX I EMERGENCY ACTION LEVEL GUIDELINES FOR STEAM GENERATOR LEAKAGE

CONSOLIDATED EDISON COMPANY OF NEW YORK, INC.
INDIAN POINT UNIT NO. 2
DOCKET NO. 50-247
SEPTEMBER, 1992

Evaluation of NUREG-0654 Rev. 1 Appendix I,

Emergency Action Level Guidelines for Steam Generator Leakage

NUREG-0654 Rev. 1 Appendix I provides "example" initiating conditions for event classification for primary to secondary Steam Generator leakage that range from NUE through Alert to Site Area Emergency in a graded approach. This reflects higher levels of classification as the amount of leakage and potential consequences increase.

The Indian Point Unit 2 Emergency Action Level scheme also provides event classifications for Steam Generator primary to secondary leakage that range from NUE through Alert to Site Area Emergency in a graded approach. This methodology provides for increasingly higher classification designations due to increased leakage and potential consequences.

Specifically, for Indian Point Unit 2, the following describes the event classifications for Steam Generator (primary to secondary) tube leakage events:

NUE - Event Classification Table

Technical Specification limit exceeded
(a) TS 3.1.F.2.a(1) Steam Generator Leakage

ALERT - Barrier Breach Table

Reactor Coolant System Breach
Confirmed By:
RCS Leakage via Steam Generator:
Actual SI and Steam Generator Control not obtained

OR

Containment Breach
Confirmed by:
RCS Leakage via Unisolable Faulted Steam Generator:
Greater than 10 GPM

SAE - Event Table

1c. Loss of offsite power with Steam Generator tube rupture with actual SI and Steam Generator Control not obtained

OR

4e. Steam Generator Tube rupture with actual SI and Steam Generator control not obtained with loss of offsite power.

Barrier Breach Table - Breach of two barriers

1. Reactor Coolant System Breach

RCS Leakage via Steam Generator

AND

2. Containment Breach

RCS Leakage via Unisolable Faulted Steam Generator

As discussed in NUREG 0654 Rev. 1 Section II D:

> "An emergency classification and emergency action level scheme as set forth in Appendix I must be established by the licensee. The specific instruments, parameters or equipment status shall be shown for establishing each emergency class, in the in-plant emergency procedures. The plan shall identify the parameter values and equipment status for each emergency class."

For Indian Point Unit 2, the emergency action level classifications have been specifically linked to emergency procedures which have been prepared based upon information directly available to the operator, i.e., specific instruments, known parameters and equipment status. For relatively small Steam Generator primary to secondary leakage, radiological evaluation by the use of the air ejector radiation monitor, Steam Generator blowdown monitor, main steam line monitors and radio-chemical analysis of secondary fluid are used to determine primary to secondary leakage relative to Technical Specification requirements. These information sources can be used as initial indication of classification at the NUE level.

For larger Steam Generator tube-related primary to secondary leaks, such as would occur with a large tube leak, a single tube rupture, or multiple tube ruptures, RCS inventory loss would exceed the ability of the charging pumps for makeup. For such larger leaks, the instrument and equipment status described above would not be capable of providing the operators in the short time period required (i.e., 15 minutes) with the information necessary for event classification beyond NUE, including differentiation between partial, single or multiple tube failures. The flow through a large tube leak, single or multiple tube rupture, could initially be greater than several hundred GPM during the time period immediately following the event. Therefore, our procedures define the condition "Steam Generator control not obtained" as the entry into an Emergency Contingency Action (ECA) procedure. Entering an ECA procedure thus reflects degrading conditions. In accordance with the NUREG philosophy described above, this becomes an appropriate trigger for increasing the declaration for Steam Generator leakage to a higher level i.e., an Alert or Site Area Emergency.

We understand that members of NRC Region I staff have recently raised a concern that the specific implementing procedures at IP-2 might be interpreted so as to lead to a classification of a large Steam Generator primary to secondary leak as only an NUE. If additional indication were specified for the Operator, classification might then be made at a higher level, such as an Alert.

In order to clarify our procedures to address this concern we are prepared to revise IP-1024 by the addition of the following:

1. To more specifically address the NUREG-0654 alert example "2. Rapid gross failure of one Steam Generator tube with loss of offsite power", entry into EOP E-3 (Steam Generator Tube Rupture) concurrent with loss of offsite power will result in the declaration of an Alert.

2. To more specifically address the NUREG-0654 Alert example "3. Rapid failure of Steam Generator tubes (e.g., several hundred GPM primary to secondary leak rate)," entry into EOP E-3 (Steam Generator Tube Rupture) and narrow range level for the affected Steam Generator exceeds 92% - will also result in the declaration of an Alert.

ATTACHMENT C

# CROSS REFERENCE FOR IP-1024 TO NUREG-0654 REV. 1 APP. 1 EXAMPLE INITIATING CONDITIONS

TECHNICAL SPECIFICATION REFERENCES
PERTAIN TO THOSE IN EXISTENCE IN 1990
WHEN EVALUATION WAS PERFORMED

CONSOLIDATED EDISON COMPANY OF NEW YORK, INC.
INDIAN POINT UNIT NO. 2
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CROSS REFERENCE FOR IP-1024 To

NUREG-0654 EXAMPLE INITIATING CONDITIONS: NUE

1. Emergency Core Cooling System (ECCS) initiated and discharge to vessel.

   IP2 model NUE CLASSIFICATION TABLE item #6a.

2. Radiological effluent technical specification limits exceeded.

   IP2 model NUE CLASSIFICATION TABLE item #1b when shutdown commences as per Tech Spec 3.0.1.

3. Fuel damage indication.

   a. High offgas at BWR air ejector monitor (greater than 500,000 uci/sec; corresponding to 16 isotopes decayed to 30 minutes; or an increase of 100,000 uci/sec within a 30 minute time period).

      NA to PWRs

   b. High coolant activity sample (e.g., exceeding coolant technical specifications for iodine spike).

      IP2 model NUE CLASSIFICATION TABLE item #1b when shutdown commences as per Tech Spec 3.0.1.

   c. Failed fuel monitor (PWR) indicates increase greater than 0.1% equivalent fuel failures within 30 minutes.

      NA - no requirement to have the monitor.

4. Abnormal coolant temperature and/or pressure or abnormal fuel temperatures outside of Technical Specification limits.

   IP2 model NUE CLASSIFICATION TABLE item #1a when Tech Spec 2.1a or 2.1b is exceeded and not restored within 2 hours.

5. Exceeding either primary/secondary leak rate Technical Specification or primary system leak rate Technical Specification.

   IP2 model NUE CLASSIFICATION TABLE item #1a when Tech Spec 3.1.F.2.a is exceeded and shutdown commences.

6. Failure of a safety or relief valve in a safety related system to close following reduction of applicable pressure.

   IP2 model NUE CLASSIFICATION TABLE item #1a when Tech Spec 3.1.A.3b is exceeded and shutdown commences or Tech Spec 3.1.A.4b is exceeded for 7 days and shutdown commences or Tech Spec 3.1.A.5d is exceeded for 4 hours and shutdown commences.

7. Loss of offsite power or loss of onsite AC power capability.

   IP2 model NUE CLASSIFICATION TABLE item #3a&b.

8. Loss of containment integrity requiring shutdown by Technical Specifications.

   IP2 model NUE CLASSIFICATION TABLE item #1a when Tech Spec 3.6.A.3 is exceeded and shutdown commences.

9. Loss of engineered safety feature or fire protection system function requiring shutdown by Technical Specifications (e.g., because of malfunction, personnel error or procedural inadequacy).

   IP2 model NUE CLASSIFICATION TABLE item #1a when the requirements of TS 3.0.1 are initiated for Tech Spec 3.3 or 3.13.

10. Fire within the plant lasting more than 10 minutes.

    IP2 model NUE CLASSIFICATION TABLE item #4a.

11. Indications or alarms on process or effluent parameters not functional in control room to an extent requiring plant shutdown or other significant loss of assessment or communication capability (e.g., plant computer, Safety Parameter Display System, all meteorological instrumentation).

    IP2 model NUE CLASSIFICATION TABLE item #1a when the requirements of Tech Spec 3.5.1/3/6 are exceeded and shutdown commences.

12. Security threat or attempted entry or attempted sabotage.

    IP2 model NUE CLASSIFICATION TABLE item #4b.

13. Natural phenomenon being experienced or projected beyond usual levels.

    a. Any earthquake felt in-plant or detected on station seismic instrumentation.

       IP2 model NUE CLASSIFICATION TABLE item #5a.

    b. 50 year flood or low water, tsunami, hurricane surge, seiche.

       IP2 model NUE CLASSIFICATION TABLE item #5b&c.

    c. Any tornado on site.

       IP2 model NUE CLASSIFICATION TABLE item #5d.

d. Any hurricane.

IP2 model NUE CLASSIFICATION TABLE item #5e.

14. Other hazards being experienced or projected.

a. Aircraft crash on-site or unusual aircraft activity over facility.

IP2 model NUE CLASSIFICATION TABLE item #4c.

b. Train derailment on-site.

NA - No railroad lines on site.

c. Near or onsite explosion.

IP2 model NUE CLASSIFICATION TABLE item #4d.

d. Near or onsite toxic or flammable gas release.

IP2 model NUE CLASSIFICATION TABLE item #4e.

e. Turbine rotating component failure causing rapid plant shutdown.

IP2 model NUE CLASSIFICATION TABLE item #6c.

15. Other plant conditions exist that warrant increased awareness on the part of plant operating staff or State and/or local offsite authorities or require plant shutdown under Technical Specification requirements or involve other than normal controlled shutdown (e.g., cooldown rate exceeding Technical Specification limits, pipe cracking found during operation).

By procedure (IAP-10), activation of the TSC and EOF will occur at the NUE for certain events. Other items not considered as NUEs may require notifications as per SAO-124.

16. Transportation of contaminated injured individual from site to offsite hospital.

IP2 model NUE CLASSIFICATION TABLE item #2a.

17. Rapid depressurization of PWR secondary side.

IP2 model NUE CLASSIFICATION TABLE item #6b.

## CROSS REFERENCE FOR IP-1024 TO

## NUREG-0654 EXAMPLE INITIATING CONDITIONS: ALERT

1. Severe loss of fuel cladding.

   a. High offgas at BWR air ejector monitor (greater than 5 ci/sec; corresponding to 16 isotopes decayed 30 minutes).

      NA to PWRs.

   b. Very high coolant activity sample (e.g., 300 uci/cc equivalent of I-131).

      IP2 model barrier breach table uses 28 uCi/cc Xe-133 which would equate to approximately 10 uCi/cc I-131 and therefore is more conservative.

   c. Failed fuel monitor (PWR) indicates increase greater than 1% fuel failure within 30 minutes or 5% total fuel failure.

      IP2 model utilizes the analysis of an RCS sample. Alert classification is made upon exceeding 28 uCi/cc Xe-133 which represents >5% GAP release.

2. Rapid gross failure of one steam generator tube with loss of offsite power.

   IP2 model barrier breach table utilizes the use of the EOPs to classify this situation by specifying the requirement for "actual SI and SG control not obtained". Control is defined as exit from procedure E-3, ES-3.1, ES-3.2 or ES-3.3 to an ECA procedure.

3. Rapid failure of steam generator tubes (e.g., several hundred gpm primary to secondary leak rate).

   Would be classified as required in #2 above.

4. Steam line break with significant (e.g., greater than 10 gpm) primary to secondary leak rate (PWR) or MSIV malfunction causing leakage (BWR).

   IP2 model barrier breach table defines this as "RCS leakage via unisolable faulted SG >10 gpm."

5. Primary coolant leak rate greater than 50 gpm.

   IP2 model barrier breach table defines this as "RCS Leakage >100 gpm" because the 100 gpm is an identifiable point where another charging pump must be placed into service.

ALERT - continued

6. Radiation levels or airborne contamination which indicate a severe degradation in the control of radioactive materials (e.g., increase of factor of 1000 in direct radiation readings within facility).

   IP2 model EVENT BASED ALERT TABLE item #5c.

7. Loss of offsite power and loss of all onsite AC power (see Site Area Emergency for extended loss).

   IP2 model EVENT BASED ALERT TABLE item #1a.

8. Loss of all onsite DC power (See Site Area Emergency for extended loss).

   IP2 model EVENT BASED ALERT TABLE item #1b.

9. Coolant pump seizure leading to fuel failure.

   IP2 model barrier breach table defines the condition of failed fuel as >28 uCi/cc Xe-133 in RCS sample.

10. Complete loss of any function needed for plant cold shutdown.

    IP2 model EVENT BASED ALERT TABLE item #4d.

11. Failure of the reactor protection system to initiate and complete a scram which brings the reactor subcritical.

    IP2 model EVENT BASED ALERT TABLE item #4a.

12. Fuel damage accident with release of radioactivity to containment or fuel handling building.

    IP2 model EVENT BASED ALERT TABLE item #4c.

13. Fire potentially affecting safety systems.

    IP2 model EVENT BASED ALERT TABLE item #2a.

14. Most of all alarms (annunciators) lost.

    IP2 model EVENT BASED ALERT TABLE item #4b.

15. Radiological effluents greater than 10 times Technical Specification instantaneous limits (an instantaneous rate which, if continued over 2 hours, would result in about 1 mr at the site boundary under average meteorological conditions).

    IP2 model EVENT BASED ALERT TABLE item #5a.

16. Ongoing security compromise.

    IP2 model EVENT BASED ALERT TABLE item #2b.

17. Severe natural phenomena being experienced or projected.

    a. Earthquake greater than Operating Basis Earthquake (OBE) levels.

    b. Flood, low water, tsunami, hurricane surge, seiche near design levels.

    c. Any tornado striking facility.

    d. Hurricane winds near design basis level.

    IP2 model EVENT BASED ALERT TABLE items #3a thru 3d.

18. Other hazards being experienced or projected.

    a. Aircraft crash on facility.

    b. Missile impacts from whatever source on facility.

    c. Known explosion damage to facility affecting plant operation.

    d. Entry into facility environs of uncontrolled toxic or flammable gases.

    e. Turbine failure causing casing penetration.

    IP2 model EVENT BASED ALERT TABLE items #2c, d, e, f, g.

    For item 2e and 2f the interpretation is "that unless the missile or explosion impacts on the ability to reach cold shutdown (< 200°F) there would be no cause to declare an ALERT. This makes it consistent with NUREG-0654 ALERT item #10.

19. Other plant conditions exist that warrant precautionary activation of Technical Support Center and placing near-site Emergency Operations Facility and other key emergency personnel on standby.

    By procedure (IAP-10), activation of the TSC and EOF will occur under an ALERT classification or at the NUE for certain events.

20. Evacuation of control room anticipated or required with control of shutdown systems established from local stations.

    IP2 model EVENT BASED ALERT TABLE item #4b.

CROSS REFERENCE FOR IP-1024 TO

NUREG-0654 EXAMPLE INITIATING CONDITIONS: SITE AREA EMERGENCY

1. Known loss of coolant accident greater than makeup pump capacity.

   IP2 model barrier breach table would classify this condition as an SAE if the loss of coolant and the inability to make-up caused increased heating of the fuel cladding or the coolant loss was via unisolable lines outside the containment building.

2. Degraded core with possible loss of coolable geometry (indicators should include instrumentation to detect inadequate core cooling, coolant activity and/or containment radioactivity levels).

   IP2 model barrier breach table would classify this condition as an SAE because the rate of loss of RCS necessary to damage the fuel cladding would constitute a two barrier loss.

3. Rapid failure of steam generator tubes (several hundred gpm leakage) with loss of offsite power.

   IP2 model EVENT BASED SAE TABLE items #4e and 1c.

4. BWR steam line break outside containment without isolation.

   NA to PWRs.

5. PWR steam line break with greater than 50 gpm primary to secondary leakage and indication of fuel damage.

   IP2 model barrier breach table would classify this as an SAE if the steam line break was inside containment and the RCS leakage was > 100 gpm; and as a GE if the steam line break was outside the containment and, of course, not isolable.

6. Loss of offsite power and of onsite AC power for more than 15 minutes.

   IP2 model EVENT BASED SAE TABLE item #1a.

7. Loss of all vital onsite DC power for more than 15 minutes.

   IP2 model EVENT BASED SAE TABLE item #1b.

8. Complete loss of any function needed for plant hot shutdown.

   IP2 model EVENT BASED SAE TABLE item #4d.

9. Transient requiring operation of shutdown systems with failure to scram (continued power generation but no core damage immediately evident).

   IP2 model EVENT BASED SAE TABLE item #4a.

10. Major damage to spent fuel in containment or fuel handling building (e.g., large object damages fuel or water loss below fuel level).

    IP2 model EVENT BASED SAE TABLE item #4c.

11. Fire compromising the functions of safety systems.

    IP2 model EVENT BASED SAE TABLE item #2a.

12. Most of all alarms (annunciators) lost and plant transient initiated or in progress.

    IP2 model EVENT BASED SAE TABLE item #4b.

13. a. Effluent monitors detect levels corresponding to greater than 50 mr/hr for 1/2 hour or greater than 500 mr/hr W.B. for two minutes (or five times these levels to the thyroid) at the site boundary for adverse meteorology.

       IP2 model EVENT BASED SAE TABLE item #5a.

    b. These dose rates are projected based on other plant parameters (e.g., radiation level in containment with leak rate appropriate for existing containment pressure) or are measured in the environs.

       IP2 model EVENT BASED SAE TABLE item #5b.

    c. EPA Protective Action Guidelines are projected to be exceeded outside the site boundary.

       IP2 model EVENT BASED SAE TABLE item #5a.

14. Imminent loss of physical control of the plant.

    IP2 model EVENT BASED SAE TABLE items #4b and 2b.

15. Severe natural phenomena being experienced or projected with plant not in cold shutdown.

    a. Earthquake greater than Safe Shutdown Earthquake (SSE) levels.

b. Flood, low water, tsunami, hurricane surge, seiche greater than design levels or failure of protection of vital equipment at lower levels.

c. Sustained winds or tornadoes in excess of design levels.

IP2 model EVENT BASED SAE TABLE items #3a thru 3d.

16. Other hazards being experienced or projected with plant not in cold shutdown.

a. Aircraft crash affecting vital structures by impact or fire.

b. Severe damage to safe shutdown equipment from missiles or explosion.

c. Entry of uncontrolled flammable gases into vital areas. Entry of uncontrolled toxic gases into vital areas where lack of access to the area constitutes a safety problem.

IP2 model EVENT BASED SAE TABLE items #2a thru 2g.

17. Other plant conditions exist that warrant activation of emergency centers and monitoring teams or a precautionary notification to the public near the site.

By procedure IAP-10, activation of the TSC and EOF will occur for all declared SAEs, ALERTs and certain events that are classified NUEs. Notification to offsite authorities is also mandated by the same procedure.

18. Evacuation of control room and control of shutdown systems not established from local stations in 15 minutes.

IP2 model EVENT BASED SAE TABLE item #4b.

CROSS REFERENCE FOR IP-1024 TO

NUREG-0654 EXAMPLE INITIATING CONDITIONS: GENERAL EMERGENCY

1. a. Effluent monitors detect levels corresponding to 1 rem/hr W.B. or 5 rem/hr thyroid at the site boundary under actual meteorological conditions.

   IP2 model EVENT BASED GE TABLE item 5a.

   b. These dose rates are projected based on other plant parameters (e.g., radiation levels in containment with leak rate appropriate for existing containment pressure with some confirmation from effluent monitors) or are measured in the environs.

   IP2 model EVENT BASED GE TABLE item 5b.

2. Loss of 2 of 3 fission product barriers with a potential loss of 3rd barrier, (e.g., loss of primary coolant boundary, clad failure, and high potential for loss of containment).

   IP2 model barrier breach table defines this as a Major Core Overheat condition and gives a value for R-25 that a GE should be declared regardless of containment barrier integrity.

3. Loss of physical control of the facility.

   IP2 model EVENT BASED GE TABLE items 4b and 2b.

4. Other plant conditions exist, from whatever source, that make release of large amounts of radioactivity in a short time period possible, e.g., any core melt situation. See the specific PWR and BWR sequences below.

5. Example PWR Sequences.

   a. Small and large LOCA's with failure of ECCS to perform leading to severe core degradation or melt in from minutes to hours. Ultimate failure of containment likely for melt sequences. (Several hours likely to be available to complete protective actions unless containment is not isolated.

   IP2 model barrier breach table addresses this situation when it uses core temperature > 1200°F as the indicator of fuel clad breach (conservative assumption) and is consistent with the EOPs and Status Trees. In addition the use of the high range accident monitor R-25 to indicate a GE regardless of containment barrier integrity satisfied the NUREG initiating condition.

b. Transient initiated by loss of feedwater and condensate systems (principal heat removal system) followed by failure of emergency feedwater system for extended period. Core melting possible in several hours. Ultimate failure of containment likely if core melts.

IP2 model EVENT BASED GE TABLE item 4d.

c. Transient requiring operation of shutdown systems with failure to scram which results in core damage or additional failure of core cooling and makeup systems (which could lead to core melt).

IP2 model EVENT BASED GE TABLE item 4a.

d. Failure of offsite and onsite power along with total loss of emergency feedwater makeup capability for several hours. Would lead to eventual core melt and likely failure of containment.

IP2 model EVENT BASED GE TABLE item 1a.

e. Small LOCA and initially successful ECCS. Subsequent failure of containment heat removal systems over several hours could lead to core melt and likely failure of containment.

IP2 model EVENT BASED GE TABLE item 4c.

6. Example BWR Sequences.

NA to PWRs.

7. Any major internal or external events (e.g., fires, earthquakes, substantially beyond design basis) which could cause massive common damage to plant systems resulting in any of the above.

IP2 model EVENT BASED GE TABLE items 2 and 3.