10 CFR 50.90

A subsidiary of Pinnacle West Capital Corporation

Palo Verde Nuclear Generating Station

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102-06321-DCM/DFS
February 11, 2011

ATTN: Document Control Desk
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

Dear Sirs:

Subject: Palo Verde Nuclear Generating Station (PVNGS)
Units 1, 2, and 3
Docket Nos. STN 50-528, 50-529, and 50-530
Response to Request for Additional Information Regarding License Amendment Request to Revise the Feedwater Line Break with Loss of Offsite Power and Single Failure Analysis (TAC NOS. ME4596, ME4597, and ME4598)

By letter no. 102-06244, dated August 27, 2010 (Agencywide Documents Access and Management System [ADAMS] Accession No. ML102510161), Arizona Public Service Company (APS), submitted a request to revise the methodology in the feedwater line break with loss of offsite power and single failure event (FWLB/LOP/SF) analysis summarized in the Palo Verde Nuclear Generating Station (PVNGS) Updated Final Safety Analysis Report (UFSAR). The enclosures to this letter contain the responses to the NRC request for additional information, dated December 21, 2010 (ADAMS Accession No. ML103500510).

No commitments are being made to the NRC by this letter. Should you need further information regarding this response, please contact Russell A. Stroud, Licensing Section Leader, at (623) 393-5111.

I declare under penalty of perjury that the foregoing is true and correct.

Executed on FEBRUARY 11, 2011
(Date)

Sincerely,

FOR D.C. MIMS

DCM/RAS/DFS/gat

A001
NRR

Enclosures:

1. Response to Request for Additional Information (RAI) Regarding License Amendment Request (LAR) to Revise the Feedwater Line Break with Loss of Offsite Power and Single Failure Analysis (FWLB/LOP/SF)
2. Palo Verde Time Critical Action Program

cc:	E. E. Collins Jr.	NRC Region IV Regional Administrator
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Enclosure 1

Response to Request for Additional Information (RAI) Regarding License Amendment Request (LAR) to Revise the Feedwater Line Break with Loss of Offsite Power and Single Failure Analysis (FWLB/LOP/SF)

Introduction:

By letter dated August 27, 2010 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML102510161) (Reference 1), Arizona Public Service Company (APS) submitted a license amendment request (LAR) to revise the methodology in the feedwater line break with loss of offsite power and single failure event (FWLB/LOP/SF) analysis summarized in the Palo Verde Nuclear Generating Station (PVNGS) Updated Final Safety Analysis Report (UFSAR). The LAR would change the credited operator action time from 30 minutes to 20 minutes.

By letter dated December 21, 2010 (ADAMS Accession No. ML103500510) (Reference 2), the NRC requested additional information. The NRC requested information and corresponding APS responses are provided as follows:

NRC Request 1:

The LAR states that the current PVNGS emergency operating procedures (EOPs) contain explicit directions to the operators to ensure that the plant is placed in a stable, safe condition following an FWLB event. Opening of the atmospheric dump valve (ADV) that is connected to the unaffected steam generator (SG) is in the EOPs for standard post trip actions (40EP-9EO01), excess steam demand (40EP-9EO05), loss of all feedwater (40EP-9EO06), and LOP/loss of forced circulation events (40EP-9EO07). Please identify the FWLB EOP that directs the opening of this ADV as one of the variable methods.

APS Response:

PVNGS does not have a separate Emergency Operating Procedure (EOP) solely for responding to a Feedwater Line Break (FWLB) event. However, the EOP that directs the mitigation of a FWLB event is procedure 40EP-9EO05, "Excess Steam Demand." The PVNGS EOP procedures are identified by the use of the designation (EP) in the procedure number.

Following a reactor trip, operators would initially enter procedure 40EP-9EO01, "Standard Post Trip Actions," which instructs operators to utilize ADVs to maintain the RCS heat removal safety function. Procedure 40EP-9EO01 then directs operators, based on the symptoms, to proceed to procedure 40EP-9EO05, "Excess Steam Demand," and identify the most affected steam generator. Procedure 40EP-9EO05 also instructs the operators to utilize ADVs to maintain RCS temperature by feeding and steaming of the intact steam generators (SGs).

NRC Request 2:

The licensee stated that the assumed operator action of opening an ADV is not mandated by the EOPs. If an operating crew decides to use alternate methods, please explain if the time duration of the various action sequences will be less than or equal to opening an ADV.

APS Response:

This statement was noting that opening an ADV is not mandated by EOPs as the only action in response to a trip and/or FWLB to maintain the RCS heat removal. Depending on plant system availability, operators could also choose to maintain RCS heat removal using the steam by-pass control system (SBCS) if off-site power is available. For the limiting FWLB scenario, the analysis considers a loss of off-site power and does not credit SBCS when evaluating the event. Hence, the only operator action and its timing credited in this event is opening of an ADV.

NRC Request 3:

The table in Insert C of the Enclosure to the letter dated August 27, 2010, indicates that the operators will open the ADV, at 20 minutes, to 10 percent of its full throat area. From this, it is inferred that the intent is to maintain the shell-side water level by relieving only the steam that is generated by boiling off the incoming 650 gallons per minute of auxiliary feedwater flow.

a. Please show that there is a stable SG water level indication available to the operators;

b. Please discuss the effect, if any, upon SG water level indication caused by the FWLB-induced hostile environment in the region of the intact SG;

c. Please confirm that the ADV flow area can be controlled to 10; and

d. Please confirm that, given the LOP, there is a reliable and sufficient source of power to move the ADV, continually, to maintain the desired relief rate, for at least 10 minutes.

APS Response:

The utilization of ADVs after a FWLB event is primarily to establish and maintain RCS heat removal, rather than maintaining SG level. Prior to the operators taking action to cool down the plant, the secondary system peak pressure would be limited by the MSSVs, which have sufficient capacity to relieve steam generated by RCS heat sources. However, plant operators would take action to cool down and depressurize the plant by feeding the steam generators with auxiliary feedwater (AFW) flow and by releasing steam through the ADVs rather than rely on the MSSVs.

During the event, the PVNGS design automatically isolates flow to the SGs on a main steam isolation signal (MSIS), and the engineered safety features actuation system (ESFAS) will divert the full AFW flow to the intact SG (i. e., AFW delta-p lockout). These automatic actuations will control RCS heat removal and maintain inventory in the intact SG until the operators take manual control of feeding and steaming of the intact SG.

a. As described in UFSAR, Section 7.5, "Safety-Related Display Instrumentation," there are four wide-range and four narrow-range level indicators per SG in the control room which are available to the operators to monitor conditions in the steam generating systems and safety-related process systems, throughout all operating conditions of the plant. These instruments ensure that the operators have adequate information available for performing actions important to plant safety during and following design basis events. Although the FWLB analysis demonstrates that the SG level is expected to exceed the narrow-range level instrumentation, the four safety-grade wide-range level indicators for the intact SG will still be available to the operators.

b. The level and differential pressure transmitters and associated equipment that supply input signals to the control room are environmentally qualified (EQ) for the post-FWLB induced hostile environment in the region of the intact SG. Therefore, the FWLB-induced hostile environment will not adversely affect the SG level indication.

c. To maintain heat removal and/or control RCS cooldown, after an ADV is open, the operators can manipulate the throat area (i. e., the cross-sectional flow area) of the ADV(s) from the control room from zero to 100 percent by adjusting a thumbwheel. However, for the FWLB analysis the ADV throat area is conservatively assumed to be left at 10 percent throughout the transient.

d. As described in UFSAR Section 8.3.2, each of the two (Class 1E) batteries has sufficient capacity to independently supply the required station loads during the FWLB event for at least two hours. In addition, as described in UFSAR Section 3.2.2.4, the backup safety grade nitrogen accumulator for each ADV is sized to ensure continued ADV operation for at least 13.3 hours. Therefore, reliable and sufficient sources of power or motive force are available to ensure the capability of the ADVs to maintain any desired relief rate far beyond 10 minutes.

NRC Request 4:

Please provide an evaluation to show that the 20 minutes includes the time allowed for indication and recognition, diagnosis, operator action, and system response. Include all documentation required by American National Standards Institute/American Nuclear Society (ANSI/ANS)-58.8, 'Time Response Design Criteria for Nuclear Safety Related Operator Actions' (i. e., the required operator action and the manipulations that make up the action, the indications that prompt the operator(s), and the feedback by which the operator verifies that the action succeeded or failed). Also, please provide event analysis chart(s) showing the assumed time interval estimates including time to indication, time to diagnose, time to complete the action, process time until success or failure would be recognized, and safety margin assumed, if any. Information provided in response to this request for additional information should provide evidence that PVNGS operators are highly likely (95 percent confidence or higher) to be capable of performing

the required actions in the expected control room environment within the assumed time constraints of the analysis.

APS Response:

The response to this request has been combined with the response to NRC Request 5 below.

NRC Request 5:

Please provide any available empirical human performance data, such as timed simulator training scenarios, that are available to derive time intervals that could justify crediting the 20-minute assumption. The NRC staff notes that, in accordance with ANSI/ANS-58.8, such empirical evaluation should be designed to yield results at a 95 percent confidence level. Information provided in response to this request for additional information should provide evidence that PVNGS operators are highly likely (95 percent confidence or higher) to be capable of performing the required actions in the expected control room environment within the assumed time constraints of the analysis.

APS Response for 4 and 5:

The timing of the operator action was selected based on the guidance and requirements of ANSI/ANS-58.8-1984. The data and selected Time Test Values (TTV), demonstrating a 95 percent confidence level, that are provided and justified in the ANSI/ANS-58.8-1984, Appendix, were also used. The application of criteria defined in Section 6 of the standard was utilized to evaluate the nuclear safety related automatic and manual actions, and associated time. Figure 1 (page 8) illustrates the discrete time points for the event. The following sections provide the details of the evaluation performed for FWLB, and describe the discrete time points provided in Figure 1:

Time for completion of nuclear safety function (t_f):

ANSI/ANS-58.8-1984 defines this time as: "The time at which a particular nuclear safety function must be completed to prevent a design requirement from being exceeded." This time is determined by examining the event behavior, in accordance with ANSI/ANS-58.8-1984, Section 5.2. The PVNGS analysis examined the event behavior with the most adverse initial and transient conditions and determined that the nuclear safety function (i. e., PSV operability for RCS pressure relief) would be exceeded at 26.5 minutes after the event initiation.

Time Test 1 and Time Margin Complete (t_m):

ANSI/ANS-58.8-1984, Section 5.0, provides the required time tests and their allowed values. Time Test 1 is used to establish a conservative time interval that shall elapse from the design basis event indication until operator action may be considered for operator initiation of nuclear safety function, ($t_m - t_e$). During this interval, all nuclear safety functions shall have been initiated by automatic protection systems. This interval is lengthened as the severity of the operator stress increases, the event frequency decreases, and the familiarity of the operator decreases. This allows a longer time

margin for an operator to recover from initial stress, evaluate the event, and identify required actions. This time interval also allows the operator to ensure the correct accomplishment of the nuclear safety functions by monitoring for proper automatic initiation of the functions and initiating backups to those automatic functions. Per Table 1 of ANSI/ANS-58.8-1984, the minimum test margin, ($t_m - t_e$), is 20 minutes for a FWLB+LOP+SF which is a Limiting Fault Event for PVNGS.

At PVNGS, immediately following a FWLB, operators would receive various alarms indicating the event. The time from the initiation of the event to the alarm indications does vary depending on the input to the alarm. An almost immediate (within one second) alarm from the trip of feedwater pumps on overspeed is expected to be the earliest indication. In addition, for a FWLB inside containment, within approximately two to three seconds, alarms would initiate on containment conditions (e.g., high containment humidity, and containment temperature, which would alert the operators of the energy release to the containment). There are other control room alarms and indications, such as high containment pressure pre-trip alarm, pressurizer narrow (and wide) range high pressure alarms, etc., available to the operators in less than 10 seconds from the initiation of the FWLB event. Based on guidance in ANSI/ANS-58.8-1984, the earliest time at which operator action can be considered in the design evaluation (t_m) is 20 minutes plus the one second alarm delay from event initiation to the feedwater pump trip alarm. In the PVNGS analysis, the earliest time plus the alarm delay was modeled to be 20 minutes.

Verification of Automatic Functions:

ANSI/ANS-58.8-1984, Section 6.4 requires that all nuclear safety functions that must be initiated during the Time Test 1 time margin to prevent exceeding design requirements shall be initiated by automatic protection systems. The following automatic initiations of the nuclear safety functions and other automatic actuations occur within approximately 30-40 seconds following the FWLB:

- Reactor trip on high pressurizer pressure (HPPT) and low steam generator level (LSGLT). It should be noted that the analytical methodology requires HPPT to coincide with LSGLT which is delayed until the affected SG is depleted of its liquid inventory.
- Engineered safety function actuation system (ESFAS) actuations: Safety injection actuation signal (SIAS), containment isolation actuation signal (CIAS), main steam isolation signal (MSIS), and containment spray actuation signal (CSAS)
- Pressurizer safety valve (PSV) opening
- ESFAS actuation: Auxiliary feedwater actuation signal (AFAS)
- Turbine trip (followed by a loss of offsite power)
- Main steam safety valve (MSSV) opening
- Main steam isolation valve (MSIV) closure

- AFW delta-p lockout

The listed automatic protection systems are credited to initiate and prevent exceeding design requirements during Time Test 1.

Time Test 2 and Latest Time to Initiate Operator Action (t_i):

Time Test 2 is applied to each action under consideration for operator initiation, and represents a conservative time delay that shall be allowed for completion of each nuclear safety-related operator action. Time Test 2 includes a fixed and a variable time portion. The fixed portion of operator action time delay includes time for the receipt of a very simple indication or alarm that identifies the initial need for the action and additional time to verify the need for the action and identify the action required. The variable portion is added to allow a minimum of one minute for each discrete manipulation (e.g. opening a valve).

As stated in ANSI/ANS-58.8-1984, Section 5.4, the fixed portion of the time delay may be eliminated if the Time Test 2 starts immediately after the time margin of Time Test 1 since it can be assumed that the operator actions are already identified. Included in the 20-minute Time Test 1 value is allowance for the operators to ensure the correct accomplishment of nuclear-safety functions by monitoring the automatic initiation of associated functions. This Time Test 1 value also considers the time it takes for operators to initiate manual backup actions to maintain heat removal, if required. The manual action taken in the analysis is primarily based on initiating back up to an automatic function which the operators are trained on specifically. The operators are trained to prevent cycling of MSSVs by opening ADVs, regardless of the initiating event. The automatic opening and cycling of MSSVs are determined from the event behavior to be around 38 seconds after FWLB event initiation which would indicate the need for ADV opening very early in the Time Test 1 interval. Additionally, opening of ADVs do not require any action outside the control room. Thus, the fixed portion of the Time Test 2 is eliminated in the PVNGS evaluation. Based on ANSI/ANS-58.8-1984, the variable portion of Time Test 2 is taken as one minute which meets a 95 percent confidence level for a single manipulation, i.e., time for opening the ADV, and time for verification that the action controlled by the manipulation has been initiated (e.g., monitoring decreasing SG pressure).

For the ADVs, the single manipulation includes energizing the permissive solenoids and dialing the thumbwheel above the permissive switch used for the initial valve position. That single manipulation is performed in the control room, on the same board. Although the equipment response and process time would be implicit in this Time Test 2 value since the verification of ADV opening is required, an additional one minute is conservatively added to bound the 10-20 seconds of equipment and process time. Thus, the operator action time delay (t_c-t_i) of one minute and the equipment time delay (t_l-t_c) of one minute are used in the PVNGS evaluation. Based on the ANSI/ANS-58.8-1984, Section 6.5 these time delays shall be subtracted from the latest time that the nuclear safety function can be completed, t_l. As determined from the event behavior above, the t_l value is 26.5 minutes, resulting in the latest time for operator action (t_i) of 24.5 minutes to ensure that the PSV design limit is not exceeded.

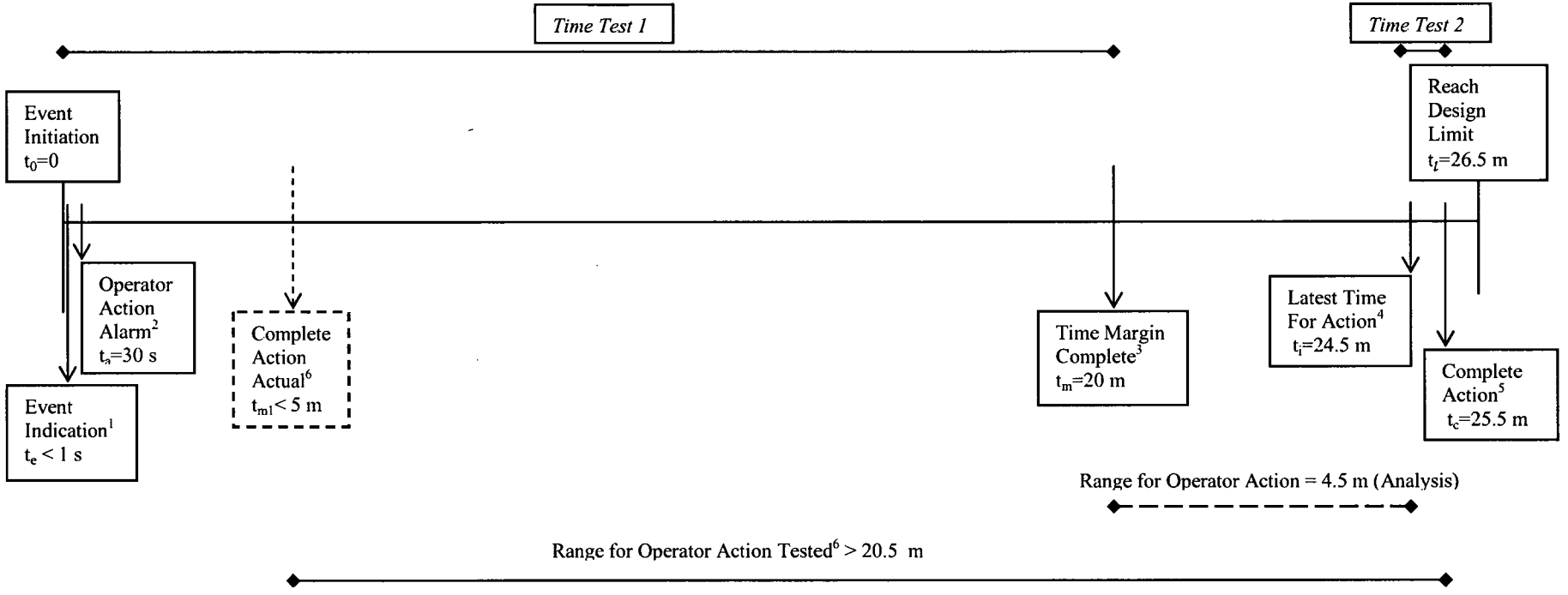
Evaluation Results and Conservatism:

The assumed 20-minute action time in the PVNGS analysis meets the requirements of ANSI/ANS-58.8-1984 for time allowed for indication, recognition, diagnosis, and planning of actions. Using the 20-minute action time plus the two minutes allowed for the operator action time delay and the equipment and process time delay, there is an additional "Range for Operator Action" margin (t_c-t_m) of at least 4.5 minutes.

During a FWLB event, the opening of an ADV is a backup response to the automatic safety related function of the MSSVs. As a result, the identification of this ADV action does not require complete diagnosis of the FWLB event. The action of opening the ADV is identified and performed per the Standard Post Trip Actions EOP, prior to entering the event specific EOP. Thus, the 20 minutes allowed by ANSI/ANS-58.8-1984 for indication, recognition, diagnosis, and planning of the action, is conservative.

As discussed in the APS response to NRC Request # 6 below, the actual observed time of action in the simulator scenarios performed were all less than five minutes from FWLB event initiation until the ADVs were opened. As shown in Figure 1, using less than five minutes as the "Complete Action Actual (t_{m1})," the time margin tested for the range for operator action (t_c-t_{m1}) would be more than 20.5 minutes.

Figure 1. Description of Time Points



1. Trip of feedwater pumps on overspeed due to the break in the feedwater line. Also, in a very short time (2-3 seconds) alarms on the containment conditions.
2. MSSV opening alerting operators to open ADV to prevent cycling of MSSVs
3. Time Test 1: Time Margin (20 min) determined by ANSI/ANS-58.8-1984 for a limiting fault event (includes Time Test 2, Fixed Portion, in accordance with the Section 5.4 of the Standard)
4. Time Test 2, Variable Portion: Time (1 min) determined by ANSI/ANS-58.8-1984 (vs. actual 20-30 seconds operator action time delay)
5. One minute assumed conservatively although the operators will have indication that action is successful (e.g., decreasing SG pressure within 10-20 seconds)
6. Based on the Simulator verification performed by three different operation crew (see APS Response to Question 6)

NRC Request 6:

Is there any empirical human performance data, such as timed simulator training scenarios, available to derive time intervals that could justify crediting the twenty minute assumption? In accordance with ANSI/ANS-58.8, such an empirical evaluation should be designed to yield results at a 95% confidence level.

APS Response:

Although ANSI/ANS-58.8-1984, Section 9 permits exceptions, the LAR did not request any exceptions to the conservative Time Test Values. Thus, no new independent database or less conservative operator action times, based on new task analyses, were derived. However, PVNGS did conduct the FWLB event scenario with three different operating crews to validate the margin available for the operator action assumed in the analysis. The following table provides the results:

Crew	Time to Open ADVs (min:sec)
I	04:00
II	03:15
III	02:03

NRC Request 7:

Please describe or provide a copy of the administrative procedure controlling the Palo Verde Time Critical Action Program.

APS Response:

The current revision of procedure 40DP-9ZZ04, "Time Critical Action (TCA) Program," is provided in Enclosure 2. The list of specific Chapter 15 analysis time critical actions can be found on Page 7 of Appendix D. As stated in Reference 1, once this amendment is approved the 20 minute operator action completion time will be added to the list of Chapter 15 analysis time critical actions in the Palo Verde Time Critical Action Program.

NRC Request 8:

The licensee stated in its submittal, "If an error were to occur for any reason there is ample indication of plant status available to the operators to ensure timely recovery." Please provide the basis for this statement. Please state how the recovery time was estimated or determined. Also, please explain how there can be sufficient time available to recover if the diagnosis takes the full 20 minutes available.

APS Response:

The LAR summarizes the evaluation of the three identified operator errors. That summary concludes: "None of the potential operator errors are considered credible; therefore, error recovery is not a concern. If an error were to occur for any reason there is ample indication of plant status available to the operators to ensure timely recovery." The referenced portion of this statement was intended to reiterate that many plant indications are available to the operator for verification of the proper action taken. It was not implying that there is any credible error. As stated in the submittal dated August 27, 2010 (Reference 1), there are no credible operator errors for this event; therefore, there was no estimated error recovery time required to be determined.

References:

1. APS letter number 102-06099, "Request for Operating License Amendment – Revision of Feedwater Line Break with Loss of Offsite Power and Single Failure Analysis," dated August 27, 2010 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML102510161)
2. NRC letter dated December 21, 2010, "Palo Verde Nuclear Generating Station, Units 1, 2, and 3 Request for Additional Information Regarding License Amendment Request to Revise the Feedwater Line Break With Loss of Offsite Power and Single Failure Analysis (TAC NOS. ME4596, ME4597, AND ME4598) (ADAMS Accession No. ML103500510)"
3. ANSI/ANS-58.8-1984, "Time Response Design Criteria for Nuclear Safety Related Operator Actions"

Enclosure 2
Palo Verde Time Critical Action Program

Time Critical Action (TCA) Program	40DP-9ZZ04	**Revision** 5

Procedure Preparer: Carol Fuccillo	**Procedure Owner:** Randy Merryman

Procedure Usage Requirements		**Sections**
Information Use:	• The user reviews the procedure, as needed before using it to perform the task. • The user may complete the task from memory, however the user still is responsible for performing the activity in accordance with the procedure. • Administrative procedures are considered Information Use unless otherwise designated within the procedure.	ALL

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1.0 PURPOSE AND SCOPE

1.1 Purpose

1.1.1 This program provides the following:

- A means to ensure that the Time Critical Actions (TCAs) within the scope as defined in Section 4.1, TCA Sources, can be accomplished by plant personnel.
- A means to document periodic validation of credited action items.
- A means to ensure that changes to the plant or to procedures or protocols do not invalidate credited action times.

1.1.2 TCAs are documented in a specific manner to enable the plant to have a firm basis for output documents that rely on accurate records of referenced TCAs.

1.1.3 This procedure supports the implementation of the Operations Program within the Operate the Plant Program Area.

1.2 Scope

1.2.1 This program applies only to those TCAs that are delineated in Section 4.1, TCA Sources. TCAs are those actions required to be performed by Operations to mitigate an event as credited by safety analysis (such as UFSAR, Fire Protection Program, PRA Human Reliability Analysis, Shutdown Risk Assessments, and Engineering Calculations).

2.0 RESPONSIBILITIES

2.1 Operations Standards Section Leader

2.1.1 Implements and maintains the TCA program.

2.1.2 Maintains current TCA validation records by maintaining validation paperwork and related documentation within the department files for at least five (5) years.

2.1.3 Organizes and coordinates periodic validation of the TCA catalog. Refer to Appendix D - Time Critical Actions Catalog.

2.2 Operations

2.2.1 Ensures minimum shift staffing is sufficient to ensure that TCAs can be performed within the required times.

2.2.2 Unit 1 only - Ensures the minimum shift staffing is sufficient to ensure that SBOG operation can be performed within the required time.

2.3 Training

2.3.1 Ensure personnel qualified in areas where TCAs are performed are trained and current in aspects relating to TCAs.

2.3.2 Support simulator validation of TCAs when required.

2.4 Operations Standards

2.4.1 Maintain a list of TCAs, and update the list as TCAs are added, deleted or modified.

2.4.2 Review changes to procedures, communications standards, procedure usage protocols, and other human performance protocols to determine impact on ability to meet TCAs.

2.4.3 Implement and document the validation of the ability to meet TCAs by completing the TCA Validation package for each identified TCA.

2.4.4 Consider the impact on related TCAs when revising procedures.

2.4.5 Require TCA validation if any TCA may be adversely impacted by a procedure change.

2.4.6 Ensure the impact of procedure revisions are review by the appropriate department for new or existing TCAs.

2.4.7 Inform Operations and Training of changes or revisions that create new TCAs.

2.4.8 Periodically benchmark other facilities per 01DP-0AP16, PVNGS Self-Assessment and Benchmarking, to assess the TCA process to current industry standards.

3.0 DEFINITIONS

3.1 **Time Critical Action (TCA)** — A manual action or series of actions that must be completed within a specified time to meet plant licensing basis. A change in the required completion time is considered to be a change to the TCA.

3.2 **Validation** — Performance of a time critical action on the simulator or by in-plant walkthrough, or both, to ensure the action can be performed within the required time using the applicable procedures, including all required human performance protocols. To the extent possible, the validation will include all assumptions used in the analysis for the action being validated.

3.3 **Simulator Validation** — A validation method, using the simulator, for new procedures, or procedure changes, that impact the sequence or logic of steps associated with plant systems or components that could increase the chance of a plant trip or transient.

3.4 **Walkthrough Validation** — A validation method where procedure performance is simulated by walking through the procedure steps at the locations specified in the procedure.

3.5 **Minimum Shift Staffing** — A validation method where procedure performance is simulated by walking through the procedure steps at the locations specified in the procedure.

3.6 **SSC** — System, Structure, or Component

3.7 **AO** — Auxiliary Operator

4.0 INSTRUCTIONS

4.1 TCA Sources

4.1.1 TCAs included within the scope of this program are listed in Appendix D - Time Critical Actions Catalog.

4.1.2 Sources of TCAs include the following:

- UFSAR
- Technical Specifications
- Station Blackout Analysis
- Licensing Commitments
- Appendix R Analysis
- At-Power PRA Study for Human Reliability Analysis
- 70DP-0RA01, Shutdown Risk Assessments

4.1.3 TCAs may be exempted from periodic validation and other program elements if both of the following are performed and documented by a cross discipline review panel (Operations, Engineering, PRA, etc.):

4.1.3.1 The TCA is determined to be of low risk significance, or

4.1.3.2 The margin between the expected performance time and required performance time is more than 200 percent.

4.1.4 Equipment used to meet the exempted TCA shall be verified on a periodic basis to be capable of meeting its credited TCA function.

4.2 TCA General Requirements

4.2.1 TCA evaluation shall include an analysis of the adequacy of the information available to the performer, the location of the devices to be manipulated and the time available for the performer to complete the action.

4.2.2 The minimum complement of plant personnel shall be maintained on site such that TCAs can be completed within the required times specified in the applicable analyses.

4.2.3 Locations outside the Control Room, including ingress and egress routes, that are required for access for performance of TCAs, shall adequately protect personnel from the environmental or radiological conditions caused by the event, or the application of personal protective equipment shall be included in the TCA.

4.2.4 Adequate lighting and communication methods shall be available for locations outside the Control Room, including ingress and egress routes, which are required for access for performance of TCAs.

4.2.5 Records of actual operating time for plant equipment used to satisfy a TCA, including valve stroke times for remotely and locally operated valves, shall be maintained.

4.2.5.1 Where it is not possible to obtain a stroke time for the specific valve to be operated, the justification for not stroke timing shall be documented, and a known stroke time for a similar valve may be used. Actual stroking of the valves credited in the analysis is strongly preferred to identify difficulties with valves. The exception to use a similar valve should only be applied in unusual situations.

4.2.6 Appendix R (that is, 40AO-9ZZ19, Control Room Fire) TCAs are to be performed on a triennial basis, prior to the Triennial Fire Inspection. A PVAR shall be written to document the requirement to perform an Appendix R TCA validation prior to the next Triennial Fire Inspection.

4.2.7 Station Blackout TCAs (that is, 40EP-9EO08, Blackout, and 40EP-9EO10, Standard Appendices, Appendix 53 & 80) are to be performed in conjunction with the performance of 40ST-9GT06, Station Blackout Generator #1 Timed Test and 40ST-9GT07, Station Blackout Generator #2 Timed Test.

4.2.8 For all Non-Appendix R (that is, 40AO-9ZZ19, Control Room Fire) TCAs, a PVAR shall be written to document the requirement to perform a TCA validation within five (5) years of the completion of the previous TCA validation.

4.2.9 Validation of new or revised TCAs should receive a sufficient number of performances, typically by three (3) different performers (or crews), in order to provide reasonable assurance that the TCA can be completed within the required time.

4.3 TCA Validation

4.3.1 Reasons for Validating TCAs

4.3.1.1 TCAs are initially validated to determine whether design assumptions for operations personnel are able to be performed within the specified time constraints.

4.3.1.2 TCA performance must be periodically validated to ensure that changes in plant equipment configuration, procedures, shift staffing, or staff knowledge is sufficient/adequate to support/not inhibit successful completion of tasks within the specified time constraints.

4.3.1.3 Conditions that could prompt validation or re-validation of one or more TCAs include, but are not limited to, the following:

- Procedure changes
- Engineering request due to plant modification, design change, revised analyses, PRA results, etc.
- Change or proposed change in plant protocol such as human performance procedures or standards.
- Periodic validation at a frequency that ensures the continued ability to meet TCAs, not to exceed five (5) years. This includes verifying the ability of locally operated equipment, tools, keys, flashlights or other devices or supplies to perform their required TCA function. Periodic validation is a valuable tool for detecting an unexpected challenge to TCA completion time, which may occur due to the aggregate of procedure and protocol changes and equipment modifications over time.
- Operations management request
- Degrading trend in TCA completion time

4.3.2 Validation Methods

4.3.2.1 TCAs that have required completion times such that simulator scenario or in-plant walkthrough validation is feasible shall be validated on the simulator or by walkthrough, controlled by a TCA Validation package.

4.3.2.2 TCAs that have required completion times such that simulator or in-plant walkthrough validation is not feasible shall be validated using alternate means. This should include a combination of simulator validation for such portions (if any) for which the simulator is useful, in-plant walkthrough for applicable portions (if any), and reasonable engineering judgment to waive those portions that are not satisfied by simulator or in-plant walkthrough.

a. The basis for waiving all, or any portion, of a TCA validation should be documented. This provision should not be used as a routine validation convenience in lieu of other alternatives that appropriately validate TCA completion times

4.3.2.3 Applicable training records such as simulator scenarios, JPM performance may be used to document periodic validation of TCA completion times, provided that such validation is consistent with the TCA Validation section of the TCA Program.

4.3.3 Validation Objectives

4.3.3.1 Ensure the times are met as specified in the plant licensing basis.

4.3.3.2 Demonstrate that the language, level of information, sequencing and number of tasks in the procedure is compatible with the minimum staffing, qualification, training and experience of plant personnel.

4.3.3.3 Verify lighting, component labeling, accessibility of equipment, tools, keys, flashlights and other devices or supplies are adequate for successful completion of the TCA.

4.3.4 Validation Aspects

4.3.4.1 There are three major parts of the TCA program:

a. Design TCA identification of requirements: This is typically an Engineering function and is performed by Engineering. Part of the output of a Design Basis Review will be manual actions that are time limited (TCAs). When new TCAs are identified, or existing TCAs are identified as requiring updating, Engineering should notify, as a minimum, Operations and Operations Standards.

b. Equipment operation times: This is a validation that the individual components within the TCA are able to be operated with identified methods and within assumed times. These are the recorded measured times for individual manual operation of SSCs upon which the task validations are based. The SSCs, identified in Appendix E - Manual Component Manipulation Times, should be periodically inspected and cycled to ensure time assumptions are valid.

1) Operations and Operations Standards shall be responsible to populate Appendix E - Manual Component Manipulation Times, with manually operated SSCs required to support identified TCAs.

2) Operations shall perform manipulation of the SSCs listed in Appendix F - Manual Manipulated / Timed Component List to establish the required time to operate each SSC.

3) The SSCs listed in Appendix E - Manual Component Manipulation Times, should be re-validated over a period of five (5) years. Deficiencies identified should be promptly corrected.

c. TCA task evaluation: This is the comprehensive validation that a TCA task can be performed within the design time period, including all performer tasks, such as briefings, notifications, travel. This should include those personnel necessary to evaluate and perform the TCA. The team should include a combination of the following, appropriate to the TCA validation being performed.

1) Team Leader: The validation team leader possesses a level of knowledge commensurate with the task being validated, including the relation of the task to the TCA requirements.

2) TCA performer(s) - The TCA performers include only the minimum staffing required by the TCA analysis. The qualifications of the performers should be typical of the level of experience and training of personnel expected to perform the actions during an actual event.

3) Observers - one observer will be required to time the actions of each of the performers if a group of task performers is required (such as a Control Room crew).

4) Optional personnel - Depending on the reason for validation (such as procedure changes, plant modifications), or the need for additional expertise, other personnel representing Training, Engineering, PRA, Site Procedures Standards or other groups of interest may be desired for observing or validating the TCA.

5) Training support - Training personnel, with input from other groups as needed, develop simulator scenarios, JPM scenarios or other appropriate evaluation methods consistent with the TCAs, including initial conditions, assumed equipment or system availability or failures, and other conditions associated with the TCA, to the extent possible.

6) Simulator validation - the most effective method of testing Control Room procedures to ensure the assumed time lines can be accomplished.

7) In-plant walkthrough validation - the most effective method for local actions required for a TCA, or when simulator modeling constraints prevent effective validation using the simulator.

8) A combination of simulator and in-plant walkthrough validation is most effective for time lines which include actions both in the Control Room and in the plant.

9) Special equipment, tools, keys, flashlights or other devices or supplies that are required to support the TCA are readily available.

NOTE

Evaluators record required information but do not interfere with, distract or inappropriately prompt the performers during the execution of the TCA validation.

4.3.4.2 Validation of new or revised TCAs should include a briefing of the validation team by the Team Leader. This briefing includes the following:

- The purpose of the validation.
- Discussion of the TCAs being validated.
- Content and purpose of revised actions or time requirements.
- Performer responsibilities.
- Evaluator responsibilities.

4.3.4.3 Periodic or unannounced TCAs Validations are performed without briefing the performers on the specifics of the TCA. This restriction is intended to avoid coaching or preconditioning of the TCA performers, and is not meant to exclude other plant-required aspects of pre-job briefs such as safety, ALARA, protected equipment.

4.3.5 Validation Process

4.3.5.1 The Team Leader shall prepare the validation package by completing the applicable fields in Appendix A - TCA Evaluation Briefing. If multiple Appendices will be performed during the evaluation, document the performer that is assigned to perform each Appendix that is being evaluated.

4.3.5.2 The Team Leader shall ensure that potentially impacted workgroups/departments are given sufficient notice of the evaluation date, time and resource requirements such that the evaluation can be performed with limited impact to daily plant activities.

4.3.5.3 The Team Leader or preparer shall review the TCA to ensure that all SSCs found in the TCA have baseline times established (listed in supporting calculations, such as 13-MC-FP-0316), or ensure that the SSCs are tested prior to TCA final calculation (Refer to 4.3.7.1).

4.3.5.4 For walkthrough validations, on the day of the evaluation, the Team Leader shall interface with the Shift Manager, RP, Security, etc., as to the suitability of conducting the evaluation with regard to impact to on-going or plant activities.

4.3.5.5 Starting Point

a. The evaluation shall start at the most likely or most limiting place of origin of the evaluated participant. For Operations personnel, this may be the Control Room or the Auxiliary Operator (AO) work station. If the AO needs to meet with the Control Room Supervisor (CRS) / Shift Manager (SM) or other supervisor, travel to that location shall be included in the timed session.

4.3.5.6 Briefing

a. The Team Leader shall brief the evaluated participant(s) on the expected performance of the task, such as those actions and methods that the participant would use during actual performance of the task without supervision or observers. Use Appendix A - TCA Evaluation Briefing to perform the briefing. Additional detail should be entered onto the Appendix page for retention.

4.3.5.7 Evaluation commencement

a. The Team Leader shall read any initial conditions from the scenario description that will give the evaluated participant sufficient information to recognize the event at hand, procedures needed, communications required, etc., to get started in the performance of the evaluation.

1) If there are lead-in instructions to make the task realistic, it is appropriate to start several steps ahead in the procedure as long as the evaluation team understands where the actual starting point of the task is ("time zero").

4.3.5.8 Performance of the evaluation

a. Once the evaluated participant acknowledges the initiating queues, the scenario begins and the team shall note the clock time that each instruction is started and completed.

1) If a valve is to be operated (or similar task is performed) that takes an extended period of time, the Team Leader shall note the time that the participant arrives at the component and states the intended operation. At that time, the Team Leader shall respond that the component is in its intended position. The "Time to Operate" or to perform that specific action shall be added into the total elapsed time following completion of the task evaluation. The team shall also take notes of any issues observed that may inhibit the completion of the TCA.

4.3.5.9 Termination of the evaluation

a. At the completion of the task, the Team Leader shall collect the notes from the evaluation team. The team shall assist the evaluated participant in restoring any used support equipment.

4.3.5.10 Determination of Elapsed Time for a TCA (for TCAs involving predecessor TCAs and/or assumed times):

a. Establish "Time Zero."

b. Add any assumed times for the performance of specific steps (for example, one minute is added for communication with the Shift Manager, one minute is added for CRS performance of 40AO-9ZZ19, Control Room Fire, Appendix Z).

c. Note the time at which the predecessor action is completed (for example, the successor TCA is commenced).

d. Add any assumed times for component manipulations, as documented in Appendix F - Manual Manipulated / Timed Component List under Time to Operate.

e. Calculate the total elapsed time for completion of the TCA.

4.3.5.11 Review and closure:

a. The Team Leader compares the notes gathered from the team and determines if the required times were met. Any observations of obstructions or inhibitors that resulted from plant conditions (plant activities, support group actions, material condition, etc.), or procedure deficiencies that lead to degradation of the task performance, shall be documented in the notes. PVARs shall be originated to document required corrective actions and the SM / CRS shall be apprised of any plant issues noted.

4.3.5.12 Completion of Documentation:

a. The Team Leader completes the remaining fields of Appendix B - TCA Package Cover Page, then assembles Appendix A - TCA Evaluation Briefing, Appendix B - TCA Package Cover Page, the marked-up procedure / Appendix pages, Appendix D - Time Critical Actions Catalog pages for TCAs that were evaluated, and any additional documentation used to calculate actual TCA completion times.

4.3.5.13 Operations and other associated departments shall be notified of the results of the evaluation.

4.3.5.14 Processing package:

a. Store the current TCA validation records and related documentation within the department files and in an online folder for at least five (5) years.

4.3.6 Conduct of Validation

4.3.6.1 Validation on simulator

a. Performers take their positions in the simulator control room.

b. Briefing is performed on initial conditions and team member responsibilities, including record of time data.

c. Evaluation team is positioned so as not to interfere with or distract performers or inhibit traffic paths.

d. Copies of applicable procedures and related support documents are available for use consistent with availability in the actual Control Room.

e. The simulated event is executed according to the predetermined scenario.

f. For periodic or unannounced validation, the scenario should continue until the TCA is completed. If the time requirement has been exceeded, the scenario should be continued to aid in determined required changes to accomplish the TCA within the required time. The Team Leader determines when there is no benefit to continuing the scenario.

4.3.6.2 Validation by Walkthrough

a. The Team Leader will instruct the performer to perform the procedure or sections of the procedure consistent with the method of notification expected during an actual event, per guidance of Appendix A - TCA Evaluation Briefing. Termination criteria and cues should be included in this briefing.

b. If the performer must obtain a procedure to perform the TCA, a verified current copy of the procedure should be pre-staged at the location where the performer would be expected to obtain it.

c. Performers begin validation at a location where the performer may reasonably be expected to be, based on the event in progress.

d. Evaluation team members are stationed at locations appropriate for the TCA.

e. Performers simulate the actions required by the applicable procedures by performing the following:

1) Obtain required equipment such as keys, ladders, tools, spool pieces, and place where required by the procedure.

2) Locate the designated equipment.

3) Simulate using the equipment.

4) Locate and read required instrumentation.

5) Simulate communications necessary to perform the TCA.

4.3.7 Non-Personnel Validation Aspects

4.3.7.1 Equipment operating times (validated plant performance data)

a. The "Time to Operate" valves for plant equipment listed in Appendix F - Manual Manipulated / Timed Component List should be used during evaluations.

b. Where it is not possible to obtain a stroke time for the specific valve to be operated or for a similar valve, an appropriate estimate of stroke time may be used based on plant surveillance times or use of a stroke time from a similar component. This deviation shall be noted in the evaluation package notes.

4.3.7.2 Ingress / egress routes

a. Pre-determined routes are used to ensure adequate protection from environmental conditions caused by the initiating event for the time ad route required for ingress, TCA performance, and egress.

4.3.7.3 Time keeping

a. Designated team members record scenario start time, completion of tasks important to the TCA, and the time of completion of the TCA. Calibrated time instruments are not required, but personal watches should be in synch with the simulator clock during simulator evaluations, or synchronized with the Team Leader during field evaluations.

4.3.7.4 Human performance protocols

a. TCA validation includes the use of all current plant human performance protocols and standards for the tasks and procedures being performed.

b. Standards may include, but may not be limited to, the following:

- Communication standards
- Procedure use and adherence standards
- Briefing requirements
- Placekeeping requirements
- Verification techniques such as self checking, peer checking, independent verification, and concurrent verification
- Personal Protective Equipment requirements.

4.3.7.5 Evaluation conclusion

a. The evaluation shall be terminated based on change in plant status (emergency occurs).

b. Upon reaching the termination criteria (conclusion of task), the Team Leader is responsible to ensure that all tools, ladders, procedures, and consumable materials are properly stored or disposed of before leaving the evaluation site.

c. Team members shall have a predetermined meeting site and time to review observations and finalize conclusions.

4.3.8 Evaluation of TCA Validation

4.3.8.1 If the TCA is completed in a shorter duration than 80 percent of the TCA required time, then the TCA is considered valid, providing adequate assurance that the TCA can be reliably performed.

4.3.8.2 If the TCA is completed within 80 percent to 100 percent of the required time, then the following shall be performed:

a. Consider additional validations of the TCA using other performers.

b. Evaluate for a degrading trend in TCA completion time.

c. Generate a PVAR for an Engineering review to determine methods of reducing the actual performance time or possibly eliminating the TCA.

4.3.8.3 If the TCA is completed in a duration greater than 100 percent of the required time, then generate a PVAR for an Engineering review to determine methods of reducing the actual performance time or possibly eliminating the TCA.

4.3.8.4 If, during the performance of periodic or unannounced validation, a single shift crew (or individual) fails to meet the required time, then the following shall be performed:

a. Remediation and retesting of the crew (or individual) per the plant training program.

b. Consider performing additional validations of the TCA using other performers.

c. Evaluate for a degrading trend in TCA completion time.

4.3.8.5 If, during the performance of periodic or unannounced validation, more than one shift crew (or individual) fails to meet the required time, evaluate the ability to meet the plant licensing basis associated with the TCA. In addition, consider whether actions may be taken to improve the TCA response time. Refer to Appendix C - Options to Improve TCA Response Time, for options for improving TCA response time.

4.4 Program Documentation

4.4.1 A list of all TCAs shall be maintained in Appendix D - Time Critical Actions Catalog. The list should contain the following as a minimum:

- TCA source document
- Required action
- Required time limits
- Validation method (simulator, in-plant walkthrough, or combination)
- Procedure that performs the required TCA

4.4.2 The periodic inventory of equipment, tools, keys, flashlights and other devices and supplies required to accomplish TCAs should be retained in plant records. (This periodic inventory is performed by the Fire Department per 14FT-9FP06, Fire Equipment Locker and Emergency Equipment Cabinet Inspection.)

4.4.3 A record of cross-discipline review for those TCAs that are determined to be exempted from periodic validation or other program elements as permitted in Section 4.1, TCA Sources.

4.4.4 A record of time validation (or waiver) for each TCA shall be maintained.

4.4.5 A record of TCA SSC operating times, including valve stroke times for remotely or locally operated valves, is found in the support calculations. A baseline evaluation of each listed SSC may be performed during the initial roll-out of this program. The measured component times for the basis testing and subsequent testing for post-maintenance or other timed tests shall be documented in Appendix E - Manual Component Manipulation Times.

4.4.6 Store the program documentation records and related documentation within the department files and in an online folder for at least five (5) years.

4.5 Program changes / updates

4.5.1 Changes to the TCAs in procedures will require review and updating of this program procedure as necessary to ensure that the procedure is current.

4.5.2 Changes to assumptions made in supporting calculations shall be reviewed for impact on TCAs. Changes to TCAs will need to be reviewed for necessity of re-evaluation.

4.5.3 Changes to this program will require stakeholders of the program (such as performers, supervisors, trainers) to be part of the review and comment process.

4.5.4 Changes to this program will require timely notification of all stakeholders for internal training and qualification purposes.

4.5.5 The Operations Standards Section Leader or designee will have approval authority for changes to this program procedure.

5.0 REFERENCES

5.1 Implementing References

5.1.1 41AL-1ES2A, Safety Equipment Status System Panel ESA-UA-2A Alarm Responses

5.1.2 41AL-1ES2B, Safety Equipment Status System Panel ESB-UA-2B Alarm Responses

5.1.3 40AL-9RK2C, Panel B02C Alarm Responses

5.1.4 40AL-9RK2D, Panel B02D Alarm Responses

5.1.5 40AL-9RK3A, Panel B03A Alarm Responses

5.1.6 41AL-1RK5A, Panel B05A Alarm Responses

5.1.7 40AO-9ZZ01, Emergency Boration

5.1.8 40AO-9ZZ02, Excessive RCS Leak rate

5.1.9 40AO-9ZZ03, Loss of Cooling Water

5.1.10 40AO-9ZZ04, Reactor Coolant Pump Emergencies

5.1.11 40AO-9ZZ11, CEA Malfunctions

5.1.12 40AO-9ZZ17, Inadvertent PPS-ESFAS Actuations

5.1.13 40AO-9ZZ19, Control Room Fire

5.1.14 40EP-9EO01, Standard Post Trip Actions

5.1.15 40EP-9EO02, Reactor Trip

5.1.16 40EP-9EO03, Loss of Coolant Accident

5.1.17 40EP-9EO04, Steam Generator Tube Rupture

5.1.18 40EP-9EO05, Excess Steam Demand

5.1.19 40EP-9EO06, Loss of All Feedwater

5.1.20 40EP-9EO07, Loss of Offsite Power / Loss of Forced Circulation

5.1.21 40EP-9EO08, Blackout

5.1.22 40EP-9EO09, Functional Recovery

5.1.23 40EP-9EO10, Standard Appendices

5.1.24 40EP-9EO11, Lower Mode Functional Recovery

5.1.25 40OP-9CH01, CVCS Normal Operations

5.1.26 40OP-9EW01, Essential Cooling Water System (EW) Train A

5.1.27 40OP-9EW02, Essential Cooling Water System (EW) Train B

5.1.28 40OP-9ZZ01, Cold Shutdown To Hot Standby Mode 5 to Mode 3

5.1.29 40OP-9ZZ03, Reactor Startup

5.1.30 74RM-9EF41, Radiation Monitoring System Alarm Response

5.2 Developmental References

5.2.1 Developmental References are in the Basis Document.

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Appendix A - TCA Evaluation Briefing

A.1 The following briefing notes should be used to ensure the evaluated performer understands the expectations of this evaluated TCA.

___ All normal human performance tools are to be used per Conduct of Shift, ODs, etc., such as two minute drills and STAR.

___ The only interaction between the evaluator and evaluated shall be the giving and receiving of queues pertaining to the conduct of the task.

___ Consumable emergency equipment, such as flashlights, shall not be used; noninventoried equipment shall be supplied. If a ladder is expected to be used, the ladder can be taken from its emergency storage location and returned to the storage location at the conclusion of the evaluation.

___ Entry requirements into the RCA are to be strictly followed.

___ All plant safety expectations are applicable at all times.

___ No actual equipment manipulations should occur in performance of the evaluation.

___ If a real plant emergency occurs the TCA Evaluation will be terminated and the participant shall perform expected actions (area evacuation or muster at an Assembly Area).

A.2 The briefing shall end with the Team Leader asking the performer if there are any questions about the conduct of the task.

A.3 Briefing Notes:

_____

_____

_____

Appendix B - TCA Package Cover Page

FIGURE 1 - TCA PACKAGE COVER PAGE

Time Critical Action Validation Package

Validation Description (Procedure Section / Appendix / TCA Number(s)):		
Team Members:		Performers:
Validation Date:	Performance Method: (circle method(s) used)	Simulator / Field Walkdown
Evaluation Results:		
Corrective Actions Taken (if required):		
Package Prepared By:	Package Reviewed By:	Completion Date:

Appendix C - Options to Improve TCA Response Time

C.1 Options for improving response times include, but may not be limited to, the following:

- Modifying human performance protocol requirements. For example, excessive communications, briefings, or other requirements extend the time required to perform a procedure.
- Reducing level of detail in procedure steps. For example, if instrument identification number and control board locations are listed in the procedure for commonly used instruments, it will take longer to read and perform each step than if the commonly used instrument numbers and/or the associated control board locations are not written in the procedure.
- Changing step sequence such that more important actions are performed earlier in the procedure.
- Modifying procedure usage to increase the use of procedure handoffs, attachments, enclosures, etc.
- Modifying equipment such that fewer manual or local actions are required.
- Reanalyzing the TCA in order to modify the TCA required time such that the performer can achieve the required completion time using existing plant procedures and protocols.
- Obtaining an amendment to the plant licensing basis.

Appendix D - Time Critical Actions Catalog

TCA	Action	Time Limit	Validation Method	Procedure	Performing Organization	Source Document (other info)
TCA-1	Initiate MSIS	90 seconds	Simulator	40AO-9ZZ19	Ops	13-MC-FP-318 (40A0-9ZZ19, Section 3.0)
TCA-2	ADV Disconnects to LOCAL	5 minutes	Walkdown	40AO-9ZZ19	Ops	13-MC-FP-318 (40A0-9ZZ19, Section 3.0)
TCA-3	Close CHB-UV-515	20 minutes	Walkdown	40AO-9ZZ19	Ops	13-MC-FP-318 (40A0-9ZZ19, Section 3.0)
TCA-4	Establish AFW Flow to S/Gs	45 minutes	Walkdown	40AO-9ZZ19	Ops	13-MC-FP-318 (40A0-9ZZ19, Section 3.0)
TCA-5	Trip AFA-P01	16 minutes	Walkdown	40AO-9ZZ19	Ops	13-MC-FP-318 (40A0-9ZZ19, Section 3.0)
TCA-6	Ensure Seal Injection	60 minutes	Walkdown	40AO-9ZZ19	Ops	13-MC-FP-318 (40A0-9ZZ19, Section 3.0)
TCA-7	Determine RCS Boron concentration	2 hours	Walkdown	40AO-9ZZ19	Ops	13-MC-FP-318 (40A0-9ZZ19, Section 3.0)
TCA-8	Open PKB-D2221	7.5 minutes	Walkdown	40AO-9ZZ19	Ops	13-MC-FP-318 (40A0-9ZZ19, Appendix A)
TCA-9	Open specified breakers on PKA-D21	7.5 minutes	Walkdown	40AO-9ZZ19	Ops	13-MC-FP-318 (40A0-9ZZ19, Appendix A)
TCA-10	Open specified breakers on PKA-D21	10 minutes	Walkdown	40AO-9ZZ19	Ops	13-MC-FP-318 (40A0-9ZZ19, Appendix A)
TCA-11	RSP disconnect switches in LOCAL	10 minutes	Walkdown	40AO-9ZZ19	Ops	13-MC-FP-318 (40A0-9ZZ19, Appendix A)
TCA-12	Disable all RCP Breakers	10 minutes	Walkdown	40AO-9ZZ19	Ops	TA-13-C00-2000-004 (40AO-9ZZ19, Appendix B)

TCA	Action	Time Limit	Validation Method	Procedure	Performing Organization	Source Document (other info)
TCA-13	Disable CHA-P01 & CHE-P01	14 minutes (3 pumps running) 22 minutes (2 pumps running) 44 minutes (1 pump running)	Walkdown	40AO-9ZZ19	Ops	13-MC-FP-318 (40AO-9ZZ19, Appendix B)
TCA-14	Disable NCP breakers	60 minutes	Walkdown	40AO-9ZZ19	Ops	13-MC-FP-318 (40AO-9ZZ19, Appendix B)
TCA-15	Disable CD breakers	30 minutes	Walkdown	40AO-9ZZ19	Ops	13-MC-FP-318 (40AO-9ZZ19, Appendix B)
TCA-16	Disable EDP breakers	30 minutes	Walkdown	40AO-9ZZ19	Ops	13-MC-FP-318 (40AO-9ZZ19, Appendix B)
TCA-17	Start SP Pump B	2.6 minutes (DG fully loaded) 15 minutes (DG unloaded)	Walkdown	40AO-9ZZ19	Ops	13-MC-FP-318 (40AO-9ZZ19, Appendix C/D/E)
TCA-18	Start AF	45 minutes				TA-13-C00-2000-004(40AO-9ZZ19, Appendix C/D/E)
TCA-19	Start EC	40 minutes				13-MC-FP-318 (40AO-9ZZ19, Appendix C/D/E)
TCA-20	Start EW	35 minutes	Walkdown	40AO-9ZZ19	Ops	13-MC-FP-318 (40AO-9ZZ19, Appendix C/D/E)
TCA-21	Ensure CHB-P01 is running	30 minutes	Walkdown	40AO-9ZZ19	Ops	13-MC-FP-318 (40AO-9ZZ19, Appendix C/D/E)
TCA-22	Close DGB-V064	60 minutes	Walkdown	40AO-9ZZ19	Ops	13-MC-FP-318 (40AO-9ZZ19, Appendix C/D/E)
TCA-23	Disable CS Pump B	12 minutes	Walkdown	40AO-9ZZ19	Ops	13-MC-FP-318 (40AO-9ZZ19, Appendix F)
TCA-24	Disable CS Pump A	12 minutes	Walkdown	40AO-9ZZ19	Ops	13-MC-FP-318 (40AO-9ZZ19, Appendix F)

TCA	Action	Time Limit	Validation Method	Procedure	Performing Organization	Source Document (other info)
TCA-25	Disable AFN-P01	16 minutes	Walkdown	40AO-9ZZ19	Ops	13-MC-FP-318 (40AO-9ZZ19, Appendix F)
TCA-26	Open breakers for NC/EW Cross-tie valves	90 minutes (PCR 3510485)	Walkdown	40AO-9ZZ19	Ops	13-MC-FP-318 (40AO-9ZZ19, Appendix F)
TCA-27	Open HJ dampers disconnect switches	45 minutes (DS 01-06)	Walkdown	40AO-9ZZ19	Ops	13-MC-FP-318 (40AO-9ZZ19, Appendix F)
TCA-28	Start Fans	45 minutes (HJB-Z04)	Walkdown	40AO-9ZZ19	Ops	13-MC-FP-318 (40AO-9ZZ19, Appendix F)
TCA-29	Ensure PKA-4102 & PKA-D2110 are closed	90 minutes	Walkdown	40AO-9ZZ19	Ops	13-MC-FP-318 (40AO-9ZZ19, Appendix F)
TCA-30	Isolate EC Makeup	60 minutes	Walkdown	40AO-9ZZ19	Ops	13-MC-FP-318 (40AO-9ZZ19, Appendix F)
TCA-31	Open CHE-HV-536	30 minutes	Walkdown	40AO-9ZZ19	Ops	13-MC-FP-318 (40AO-9ZZ19, Appendix G)
TCA-32	Close CHN-UV-501	22 minutes (2 charging pumps running) 44 minutes (1 charging pump running)	Walkdown	40AO-9ZZ19	Ops	13-MC-FP-318 (40AO-9ZZ19, Appendix G)
TCA-33	Open disconnect switches on ZAN-C01	60 minutes	Walkdown	40AO-9ZZ19	Ops	13-MC-FP-318 (40AO-9ZZ19, Appendix G)
TCA-34	Open disconnect switches on ZAN-C02	60 minutes	Walkdown	40AO-9ZZ19	Ops	13-MC-FP-318 (40AO-9ZZ19, Appendix G)
TCA-35	Close CHN-V183	22 minutes (2 charging pumps running) 44 minutes (1 charging pump running)	Walkdown	40AO-9ZZ19	Ops	13-MC-FP-318 (40AO-9ZZ19, Appendix G)

TCA	Action	Time Limit	Validation Method	Procedure	Performing Organization	Source Document (other info)
TCA-36	Isolate makeup to EW B Surge Tank	60 minutes	Walkdown	40AO-9ZZ19	Ops	13-MC-FP-318 (40AO-9ZZ19, Appendix G)
TCA-37	Open breaker for SIA-UV-672	120 minutes	Walkdown	40AO-9ZZ19	Ops	13-MC-FP-318 (40AO-9ZZ19, Appendix G)
TCA-38	Disable CT Pump A	60 minutes	Walkdown	40AO-9ZZ19	Ops	13-MC-FP-318 (40AO-9ZZ19, Appendix G)
TCA-39	Ensure flow to RC Sample Cooler	90 minutes	Walkdown	40AO-9ZZ19	Ops	13-MC-FP-318 (40AO-9ZZ19, Appendix G)
TCA-40	Ensure SIA-UV-672 is closed	120 minutes	Walkdown	40AO-9ZZ19	Ops	13-MC-FP-318 (40AO-9ZZ19, Appendix G)
TCA-41	Ensure SIB-UV-671 is closed	120 minutes	Walkdown	40AO-9ZZ19	Ops	13-MC-FP-318 (40AO-9ZZ19, Appendix G)
TCA-42	Open breakers on PHB-M34	60 minutes	Walkdown	40AO-9ZZ19	Ops	13-MC-FP-318 (40AO-9ZZ19, Appendix H)
TCA-43	Open breakers on PHB-M36	120 minutes	Walkdown	40AO-9ZZ19	Ops	13-MC-FP-318 (40AO-9ZZ19, Appendix H)
TCA-44	Open NHN-M1903	60 minutes	Walkdown	40AO-9ZZ19	Ops	13-MC-FP-318 (40AO-9ZZ19, Appendix H)
TCA-45	Open SSN-V819	90 minutes	Walkdown	40AO-9ZZ19	Ops	13-MC-FP-318 (40AO-9ZZ19, Appendix H)
TCA-46	Open CHB-HV-255	60 minutes	Walkdown	40AO-9ZZ19	Ops	13-MC-FP-318 (40AO-9ZZ19, Appendix H)
TCA-47	Ensure EWA-UV-65 and EWA-UV-145 are closed	90 minutes (PCR 3510485)	Walkdown	40AO-9ZZ19	Ops	13-MC-FP-318 (40AO-9ZZ19, Appendix H)
TCA-48	Close NCN-UV-99	90 minutes (PCR 3510485)	Walkdown	40AO-9ZZ19	Ops	13-MC-FP-318 (40AO-9ZZ19, Appendix H)

TCA	Action	Time Limit	Validation Method	Procedure	Performing Organization	Source Document (other info)
TCA-49	Cross Connect EW and NC	90 minutes (PCR 3510485)	Walkdown	40AO-9ZZ19	Ops	13-MC-FP-318 (40AO-9ZZ19, Appendix H)
TCA-50	Open SSB-UV-200	90 minutes	Walkdown	40AO-9ZZ19	Ops	13-MC-FP-318 (40AO-9ZZ19, Appendix H)
TCA-51	Energize PBA-S03	60 minutes	Simulator and Walkdown	40EP-9EO08	Ops	SBO Analysis - UFSAR 8.3.1.1.10 (40EP-9EO10, Standard Appendices 53 & 80)
Note The following Time Critical Actions (TCA-52 through TCA-68) are associated with UFSAR / Safety Analysis events and PRA analysis as noted.						
TCA-52	Stop the ECCS pumps on failure of RAS valves to open	7 minutes	Simulator	40EP-9EO03 40EP-9EO09 4xAL-xES2A 4xAL-xES2B	Ops	13-MC-SI-0230 - UFSAR 6.3.2-3 item 17 (4xAL-xES2A window ES2A04A 4xAL-xES2B window ES2B04A)
TCA-53	Initiate an RCS Leak rate following receipt of high alarm or increasing trend on RU-1	60 minutes	JPM	74RM-9EF41 40AO-9ZZ02	Ops	UFSAR 5.2.5.3.3
TCA-54	Reduce power or isolate cooling water and shutdown RCP on loss of NC to RCPs	30 minutes	Simulator	40AO-9ZZ03 40AO-9ZZ04 40AO-9ZZ17 40OP-9EW01 40OP-9EW02	Ops	UFSAR 5.4.1.3 question 5A.23 (NRC Question 440.87)
TCA-55	Place H2 Analyzers inservice following LOCA	30 minutes	Simulator	40EP-9EO03 40EP-9EO05 40EP-9EO09	Ops	UFSAR 6.2.5.2.1
TCA-56	Isolate leak in SI *pump room*	30 minutes	Simulator	40AL-9RK2C 40AL-9RK2D	Ops	UFSAR 6.3.1.4.C.3 UFSAR 7.6.2.1.3.3

TCA	Action	Time Limit	Validation Method	Procedure	Performing Organization	Source Document (other info)
TCA-57	Realign HPSI for hot and cold leg injection	120-180 minutes	Simulator	40EP-9EO03 40EP-9EO09 (Std App 100)	Ops	UFSAR 6.2.3.7, 6.3.3.4.1 and 6.3.3.4.4 and Table 6.3.2-3 (item 21) PRA - 13-NS-B062, 1HLI-33HR-OP-2HR CRAI 3343684
TCA-58	SIAS manual reset is not permitted for 10 minutes following LOCA	10 minutes	Simulator	40EP-9EO02 40EP-9EO03 40EP-9EO04 40EP-9EO05 40EP-9EO06 40EP-9EO07 40EP-9EO09 40EP-9EO10	Ops	UFSAR Question 6A.46 (NRC Question 440.25) UFSAR 6.3.1.4.1.I: A SIAS will not be reset unless the operator has determined that conditions warrant this action.
TCA-59	Take appropriate action to protect the RCP on loss of NC to an RCP	30 minutes	Simulator	40AO-9ZZ03 40AO-9ZZ04 40AO-9ZZ17 40OP-9EW01 40OP-9EW02	Ops	UFSAR 7.6.2.1.3.1
TCA-60	Power one 4.16 kV Class 1E bus with one SBOG	60 minutes	40ST-9GT06 40ST-9GT07	40EP-9EO08	Ops	UFSAR 8.3.1.1.10 PRA - 13-NS-B062, AGTFAILSTRT-2HR CRAI 3343684
Note: The 30 minute time limit is specifically associated with the boration flow path with CHN-V164 (BAMP filter bypass). The 15 minute limit is associated with all boration flowpaths).						
TCA-61	Commence emergency boration (modes 3-5)	15 minutes 30 minutes	Simulator Walkdown	40AO-9ZZ01 4xAL-xRK5A 40AL-9RK3A 40EP-9EO01 40EP-9EO03 40EP-9EO04 40EP-9EO05 40EP-9EO06 40EP-9EO07 40EP-9EO08 40EP-9EO09 40EP-9EO10 40OP-9ZZ01 40OP-9ZZ03	Ops	UFSAR 9.3.4.4.2 (LCO 3.1.2) CRAI 3425589Calc 13-MC-CH-0208 50.59 E-10-0003

TCA	Action	Time Limit	Validation Method	Procedure	Performing Organization	Source Document (other info)
Note: The following Time Critical Action (TCA-62) is associated with UFSAR 15.4.3 and assumes a 15 minute (900 seconds) required action; however, LCO 3.1.5 and referenced COLR requires a more limiting action for power reduction within 10 minutes.						
TCA-62	Reduce power if dropped CEA is not realigned	10 minutes	Simulator	40AO-9ZZ11	Ops	UFSAR 15.4.3 (LCO 3.1.5)
TCA-63	Terminate inadvertent boron dilution	15 minutes (modes 1-5)	Simulator	40AL-9RK3A 40OP-9CH01 40AO-9ZZ01	Ops	UFSAR 15.4.6
TCA-64	Terminate inadvertent boron dilution	30 minutes (mode 6)	Simulator	40AL-9RK3A 40OP-9CH01 40AO-9ZZ01	Ops	UFSAR 15.4.6
TCA-65	Isolate Letdown (letdown line break) following receipt of 3 alarms	10 minutes	Simulator	40AL-9RK3A 40EP-9EO03 40EP-9EO09 40AO-9ZZ02	Ops	UFSAR 15.6.2 Note - alarms are: 1) Letdown heat exchanger high exit temp 2) Letdown line low press 3) Letdown line Rad Monitor low flow
TCA-66	(SGTR+LOP) Affected SG isolated (Hot leg target temperature reached)	70 minutes	Simulator	40EP-9EO04 40EP-9EO09	Ops	UFSAR Table 15.6.3-1
TCA-67	(SGTR+LOP +SF) Affected SG tubes covered.	46 minutes	Simulator	40EP-9EO04 40EP-9EO09	Ops	UFSAR 15.6.3.3.2.E and Table 15.6.3-3
TCA-68	Crosstie EW to supply NC priority loads	10 minutes	Simulator	40AO-9ZZ03 40AO-9ZZ17 40EP-9EO07 40OP-9EW01 40OP-9EW02 Operator Aid	Ops	UFSAR 18.II.K.3.25
Note: The following Time Critical Actions (TCA-69 through TCA-83) are associated with PRA for all risk significant operator time critical actions where the significance is defined as a Risk Achievement Worth (RAW) that increases the risk factor by greater than or equal to 1.3)						

TCA	Action	Time Limit	Validation Method	Procedure	Performing Organization	Source Document (other info)
TCA-69	Align AFN from the Control Room following Main Feed Pump trip	75 minutes	Simulator	40EP-9EO02 40EP-9EO01	Ops	13-NS-B062, 1AFN-NOMFW-HR (exchanges with 13-NS-C054 1AFN-N0MFW-FHR [post fire]) CRAI 3343684
TCA-70	Direct an AO to the MSSS for manual control of FWIVs following loss of IA and N2 backup.	2 hours	JPM	40EP-9EO06 (Std App 43)	Ops	13-NS-B062 1AF-FWIV-2HR CRAI 3343684
TCA-71	Equalize RCS with pressure of affected SG pressure prior to overfill (single tube rupture).	1.4 hours	Simulator	40EP-9EO04 40EP-9EO09	Ops	13-NS-B062, 1SG-DPRSE-ST-2HR CRAI 3343684
TCA-72	Locally align AFA-P01 after recoverable start failure (MFW unavailable)	75 minutes	Simulator	40EP-9EO06 (Std App 40)	Ops	13-NS-B062, 1AFA-NOMFW-HL CRAI 3343684
TCA-73	Align AFN (MFW available)	300 minutes	Simulator	40EP-9EO02 40EP-9EO01	Ops	13-NS-B062, 1AFN-MFW-HR CRAI 3343684
TCA-74	Isolate RWT following small break LOCA	3.6 hours	Simulator	40EP-9EO03	Ops	13-NS-B062, 4RWT-RAS-S-2HR CRAI 3343684
TCA-75	Initiate emergency boration with stuck CEAs (ATWS)	10 minutes	Simulator	40EP-9EO09	Ops	13-NS-B062, 1EMBORAT-SROD-HR CRAI 3343684
TCA-76	Align AFN to backup control power (MFW unavailable)	75 minutes	Simulator	40EP-9EO06 (Std App 41) 40EP-9EO09	Ops	13-NS-B062, 1AFN-CPWR-HL CRAI 3343684
TCA-77	Isolate SG for SGTR - single tube	4 hours	Simulator	40EP-9EO04	Ops	13-NS-B062, 1SG-OVRFL-ST- 2HR CRAI 3343684

TCA	Action	Time Limit	Validation Method	Procedure	Performing Organization	Source Document (other info)
TCA-78	Depressurize SG and supply alternate water source (Loss of All Feedwater)	3 hours	Simulator	40EP-9EO06 (Std App 44) 40EP-9EO09	Ops	13-NS-B062, 1ALFW-MWF-HR CRAI 3343684
TCA-79	Initiate a cooldown and equalize RCS with pressure of affected SG (SGTR -multiple tubes)	1.4 hours	Simulator	40EP-9EO04	Ops	13-NS-B062, 1SG-DPRSE-MT-2HR CRAI 3343684
TCA-80	Depressurize / cooldown RCS after SBLOCA	10 hours	Simulator	40EP-9EO03	Ops	13-NS-B062, 1RC-SBLOCA-L-2HR CRAI 3343684
TCA-81	Align LPSI for SDC (SGTR w/10-tube rupture, SLOCA or SLB)	6.1 hours	Simulator	40EP-9EO04 (Std. App 23)	Ops	13-NS-B062, 4SDCPROC-OP-2HR CRAI 3343684
TCA-82	Cooldown / depressurize SG with 3 tubes ruptured	4 hours	Simulator	40EP-9EO04	Ops	13-NS-B062, 1SG-OVRFL-MT- 2HR CRAI 3343684
TCA-83	Locally align AFA after recovered start failure (MFW unavailable - post fire)	75 minutes	JPM	40EP-9EO06 (Std App 40)	Ops	13-NS-C054, 1AFA-NOMFW-FHL (exchanges with 13-NSB062, 1AFA-NOMFW-HL) CRAI 3343684
TCA-84	Notify the Containment Coordinator for containment equipment hatch closure following loss of Shutdown cooling with the RCS breached.	5 minutes	Simulator	40EP-9EO11 (Std App 249)	Ops	70DP-0RA01, Shutdown Risk Assessments CRDR 3395762

TCA	Action	Time Limit	Validation Method	Procedure	Performing Organization	Source Document (other info)
TCA-85	Isolate NC system from a single RCP HP seal cooler tube leak (double ended shear)	16.67 minutes	Simulator	40EP-9EO03 40AO-9ZZ04 40AO-9ZZ02 40AL-9RK4A	Ops	13-JC-NC-0200 (supports UFSAR 9.2.2.2.9) CRAI 3478703

Appendix E - Manual Component Manipulation Times

NOTE

This appendix provides a place to record cycle times for components listed in calculation13-MC-FP-0316, Appendix A, Manual Actions List, Time to Operate column.

E.1 List the component EQID in the EQID column.

E.2 List the component nomenclature in the SSC Description column

E.3 From Appendix F - Manual Manipulated / Timed Component List, determine the required final condition of the component from the Cycle Position column, and insert into the Required Manipulation column. (If a valve is required to be stroked both open and closed, list each cycle individually.)

E.4 From Appendix F - Manual Manipulated / Timed Component List, determine the required time for the component manipulation from the Time to Operate column and insert this value into the Calc Time to Operate column.

E.5 Note the "As Found" position in the As Found Position column.

E.6 Perform the Required Manipulation and note the actual cycle time.

E.7 Record the actual cycle time in the Cycle Time column and record the date performed.

E.8 Place the component in the "As Found" position.

E.9 Perform Independent Verification per 02DP-0ZZ01, Verification of Plant Activities.

E.10 If the actual Cycle Time is less than the required Calc Time to Operate value, then no action is required. If the Cycle Time is greater than the required Calc Time to Operate value, then corrective action should be pursued, including consideration of component rework and updating the calculation.

E.11 Store current records and related documentation in the department files and in an online folder for at least five (5) years.

(Sample)

EQID	SSC Description	As Found Position	Required Manipulation	Calc Time to Operate	Cycle Time	Date Performed

Appendix F - Manual Manipulated / Timed Component List

F.1 This is a list of the components identified in Calculation 13-MC-FP-0316, 10CFR50 Appendix R Manual Action Feasibility, Appendix A, Manual Actions List, and their associated Cycle Position and Time to Operate.

EQID	DESCRIPTION	CYCLE POSITION	TIME TO OPERATE
NCN-V049	RC SAMPLE COOLER AX-9 INLET	Open	1 minute
NCN-V054	RC SAMPLE COOLER AX-9 OUTLET	Open	1 minute
DGA-V004	JACKET WATER MAKEUP HEADER ISOLATION	Open / Close	1 minute
DGA-V024	JACKET WATER MAKEUP FROM CONDENSATE TRANSFER	Ensure Open	1 minute
DGA-V058	JACKET WATER MAKEUP HEADER BACKUP FILL	Open	1 minute
DGA-V063	JACKET WATER MAKEUP SUPPLY VALVE	Ensure Open	1 minute
DGA-V013	JACKET WATER MAKEUP HDR ISOLATION	Open / Close	1 minute
DGA-V025	JACKET WATER MAKEUP FROM CONDENSATE TRANSFER	Ensure Open	1 minute
DGB-V059	JACKET WATER MAKEUP HDR BACK UP FILL	Open	1 minute
DGB-V064	JACKET WATER MAKEUP SUPPLY VALVE	Ensure Open	1 minute
FPN-V925	HOSE RACK ASSEMBLY HOSE STATION #108 ISOL	Open	1 minute
PBB-S04B	CLASS 4160V SWGR CUBICLE FEEDER FROM DIESEL GEN B	Manually charge spring and close breaker	1.5 minutes
AFA-HV-32	AUX FEEDPUMP AFA-P0A FLOW CONTROL VALVE TO S/G #1	Close	5 minutes
AFA-UV-37	AUX FEEDPUMP AFA-P01 FEED ISOLATION VALVE TO S/G #2	Close	5 minutes
AFA-HV-31	AUX FEEDPUMP AFB-P01 FLOW CONTROL VALVE TO S/G #2	Close	5 minutes
AFB-UV-34	AUX FEEDPUMP AFB-P01 FEED ISO VLV TO S/G #1	Close	5 minutes

EQID	DESCRIPTION	CYCLE POSITION	TIME TO OPERATE
AFB-UV-35	AUX FEEDPUMP AFB-P01 FEED ISOLATION VALVE TO S/G #2	Close	5 minutes
AFC-HV-33	AUX FEEDPUMP AFA-P01 FLOW CONTROL VALVE TO S/G #2	Close	5 minutes
AFC-UV-36	AUX FEEDPUMP AFA-P01 FEED ISOLATION VALVE TO S/G #1	Close	5 minutes
CHB-HV-255	SEAL INJECTION CONTAINMENT ISOLATION	Open	2 minutes
CHB-HV-530	RWT TO TRAIN 'B' SI PUMPS SUCTION	Open	15 minutes
CHE-HV-536	GRAVITY FEED TO CHARGING PUMPS SUCTION	Open	3 minutes
CHB-V319	CHARGING PUMP 2 SUCTION ISOLATION	Close / Open	1 minute
CHB-V327	SI TRAIN 'B' SUCTION VALVE TIE TO CHARGING HEADER	Open	1 minute
CHB-V756	CHARGING PUMP SUCTION CROSS-CONNECT	Open	1 minute
CHN-UV-501	VCT OUTLET	Close	3 minutes
CHA-V316	CHARGING PUMP 1 SUCTION ISOLATION	Close	1 minute
CHA-V755	CHARGING PUMP SUCTION CROSS-CONNECT	Open	1 minute
EWA-UV-145	NC SUPPLY ISOLATION VALVE (EW TO NC X-TIE)	Close	15 minutes
EWA-UV-65	NCWS RETURN ISOLATION VALVE (EW TO NC X-TIE)	Close	15 minutes
EWB-HCV-146	NC SUPPLY ISOLATION VALVE (EW TO NC X-TIE)	Open / Close	3 minutes
EWB-HCV-66	NCWS RETURN ISOLATION VALVE (EW TO NC X-TIE)	Open / Close	3 minutes
NCA-UV-402	NC CONTAINMENT SUPPLY ISOLATION	Open	5 minutes
NCA-UV-401	NC CONTAINMENT SUPPLY ISOLATION	Open	5 minutes
NCA-UV-99	ISOL VLV NCWS RETURN	Close	5 minutes
RCE-UV-430	RCP "1A" CONTROLLED BLEEDOFF ISOL VALVE	Close	2 minutes
RCE-UV-431	RCP "1B" CONTROLLED BLEEDOFF ISOL VALVE	Close	2 minutes
RCE-HV-432	RCP "2A" CONTROLLED BLEEDOFF ISOL VALVE	Close	2 minutes

EQID	DESCRIPTION	CYCLE POSITION	TIME TO OPERATE
RCE-HV-433	RCP "2B" CONTROLLED BLEEDOFF ISOL VALVE	Close	2 minutes
SGA-HCV-179	SGB-HV-179 ACTUATOR EQUALIZING VALVE	Unlock & Open	1 minute
SGA-HV-179	STEAM GENERATOR #2 LINE 2 ATMOSPHERIC DUMP VALVE	Open / Close	4 minutes
SGE-V337	ADV-179 ACCUMULATOR SGA-X01B LP NITROGEN ISOLATION VALVE	Unlock & Close	1 minute
SGN-V349	INSTRUMENT AIR FILTER SGN-F03A BYPASS VALVE	Ensure Closed	1 minute
SGN-V966	INSTRUMENT AIR FILTER SGN-F03A OUTLET VALVE	Close	1 minute
SGA-HCV-184	SGA-HV-184 ACTUATOR EQUALIZING VALVE	Unlock & Open	1 minute
SGA-HV-184	STEAM GENERATOR #1 LINE 1 ATMOSPHERIC DUMP VALVE	Open / Close	4 minutes
SGE-V342	ADV-184 ACCUMULATOR SGA-X01A LP NITROGEN ISOLATION VALVE	Unlock & Close	1 minute
SGA-UV-134	S/G #1 STEAM SUPPLY TO AUX FEED PUMP AFA-P01	Close	3 minutes
SGA-UV-138	S / G #2 STEAM SUPPLY TO AUX FEED PUMP AFA-P01	Close	3 minutes
SGB-HCV-178	ADV-184 ACCUMULATOR SGA-X01A LP NITROGEN ISOLATION VALVE	Unlock & Open	1 minute
SGB-HV-178	STEAM GENERATOR #1 LINE 2 ATMOSPHERIC DUMP VALVE	Open / Close	4 minutes
SGE-V354	ADV-178 ACCUMULATOR SGB-X01B LP NITROGEN ISOLATION VALVE	Unlock & Close	1 minute
SGN-V353	INSTRUMENT AIR FILTER SGN-F02A BYPASS VALVE	Ensure Closed	1 minute
SGN-V964	INSTRUMENT AIR FILTER SGN-F02A OUTLET VALVE	Close	1 minute
SGB-HCV-185	SGB-HV-185 ACTUATOR EQUALIZING VALVE	Unlock & Open	1 minute
SGB-HV-185	STEAM GENERATOR #2 LINE 1 ATMOSPHERIC DUMP VALVE	Open / Close	4 minutes
SGE-V363	ACCUMULATOR SGB-X01A ISOLATION VALVE	Unlock & Close	1 minute
SIA-UV-634	SIT "1A" OUTLET VALVE TO RC LOOP "1A"	Close	15 minutes
SIA-UV-644	SIT "1B" OUTLET VALVE TO RC LOOP "1B"	Close	15 minutes

EQID	DESCRIPTION	CYCLE POSITION	TIME TO OPERATE
SIA-UV-672	CNTMT SPRAY A DISCHARGE TO SPRAY HEADER 1 VALVE	Close	15 minutes
SIB-HV-307	LPSI TO SDHX 'B' BYPASS VALVE	Throttle	25 minutes
SIB-HV-658	SDHX 'B' OUTLET TO RC LOOP 2A/2B	Throttle	5 minutes
SIB-HV-689	CS PUMP 'B' DISCH TO SDHX 'B'	Close	15 minutes
SIB-HV-690	SD CLG LOOP 'B' WARMUP BYPASS VALVE	Open / Close	15 minutes
SIB-HV-692	LPSI PUMP 'B' SUCTION VALVE (RWT)	Close	15 minutes
SIB-HV-693	CNTMT SPRAY TO SDHX 'B' BYPASS VALVE	Close / Open	15 minutes
SIB-HV-694	LPSI TO CS XTIE TRAIN 'B'	Open	15 minutes
SIB-HV-695	LPSI/CS TO SDHX 'B' X-TIE	Close	15 minutes
SIB-HV-696	CS "B" CROSSCONNECT	Open	15 minutes
SIB-UV-614	SIT "2A" OUTLET VALVE TO LOOP "2A"	Close	15 minutes
SIB-UV-624	SIT "2B" OUTLET VALVE TO LOOP "2B"	Close	15 minutes
SIB-UV-615	LPSI 'B' TO RC LOOP 2A	Open	15 minutes
SIB-UV-625	LPSI 'B' TO RC LOOP 2B	Open	15 minutes
SIB-UV-652	B TRAIN SDC SUCTION VALVE FROM RC LOOP 2	Open	15 minutes
SIB-UV-656	S/D CLG CONTAINMENT ISOLATION LOOP 2	Open	15 minutes
SIB-UV-668	LPSI "B" TO THE RWT ISOLATION VALVE	Close	1 minute
SIB-UV-671	CS PUMP "B" FLOW CONTROL VALVE	Close	15 minutes
SIC-UV-653	SHUTDOWN COOLING FROM LOOP 1 SUCTION VALVE	Open	15 minutes
AFA-K01	AUXILIARY FEEDWATER PUMP TURBINE GOVERNOR	Trip Aux FW Pump Turbine	12 seconds
AFA-HV-54	AUX FEEDPUMP AFA-P01 TRIP & THROTTLE VALVE	Close / Open	5 minutes
AFA-V084	AFN-PI-020 ROOT VALVE	Open	1 minute
AFN-PI-20 Inst. Isol. (un-numbered)	AFN-PI-20 INSTRUMENT ISOLATION	Open	1 minute
PGA-L31C4	CLASS 1E 480 VAC LOADCENTER FOR CHARGING PUMP 1	Open & Rack Out	1 minute

EQID	DESCRIPTION	CYCLE POSITION	TIME TO OPERATE
PGB-L32C4	CLASS 1E 480 VAC LOADCENTER FOR CHARGING PUMP 2	Open & Rack Out	1 minute
PGA-L35C3	CLASS 1E 480 VAC LOADCENTER ALTERNATE SOURCE TO TRANSFER SW FOR CHARGING PUMP 3	Open & Rack Out	1 minute
PGB-L36C2	480 VAC LC CUBICLE FOR PUMP CHE-P01	Open & Rack Out	1 minute
CTA-V056	CNDS SPLY ISOL TO ECW EXP TK A	Ensure Open	1 minute
ECA-V040	EXP TANK LEVEL CONT VLV OUTLET ISOLATION	Close	1 minute
ECA-V166	ESSENTIAL CHILLED WATER EXPANSION TANK BACKUP FILL CONNECTION	Open	1 minute
ECA-V174	EXPANSION TANK LEVEL CONTROL VALVE BYPASS	Open / Close	1 minute
FPN-V595	HOSE RACK ASSEMBLY HOSE STATION #86 ISOL	Open	1 minute
CTB-V057	CNDS SPLY ISOL TO ECW EXP TK B	Ensure Open	1 minute
ECB-V061	EXPANSION TANK LEVEL CONTROL VALVE INLET	Ensure Open	1 minute
ECB-V062	EXPANSION TANK LEVEL CONTROL VALVE OUTLET	Close	1 minute
ECB-V175	EXPANSION TANK LEVEL CONTROL VALVE BYPASS	Open / Close	1 minute
ECB-V545	ECW EXPANSION TANK ECB-T01 BACKUP FILL CONNECTION	Open	1 minute
FPN-V596	HOSE RACK ASSEMBLY HOSE STATION #87 ISOL	Open	1 minute
EWA-V104	FILL LINE REG. UPSTRM ISOLATION VALVE	Ensure Open	1 minute
EWA-V105	FILL LINE REG DOWNSTREAM ISOLATION VALVE	Close	1 minute
EWA-V150	EW 'A' SURGE TANK SUPPLY ISOLATION FM (CT)	Open	1 minute
EWA-V181	SURGE TANK FILL LINE REG DRAIN	Open	1 minute
EWA-V222	SURGE TANK 'A' FILL REGULATOR BYPASS	Open / Close	1 minute
FPN-V548	HOSE BACK ASSEMBLY HOSE STATION #39 ISOL	Open	1 minute
EWB-V108	FILL LINE REG. UPSTRM ISOLATION VALVE	Ensure Open	1 minute

EQID	DESCRIPTION	CYCLE POSITION	TIME TO OPERATE
EWB-V109	FILL LINE REG. DOWNSTREAM ISOLATION VALVE	Close	1 minute
EWB-V152	EW 'B' SURGE TANK SUPPLY ISOLATION FM (CT)	Open	1 minute
EWB-V185	SURGE TANK FILL LINE DRAIN ISOL VALVE	Open	1 minute
EWB-V225	SURGE TANK 'B' FILL REGULATOR BYPASS	Open / Close	1 minute
FPN-V547	HOSE RACK ASSEMBLY HOSE STATION #38 ISOL	Open	1 minute
PGA-L35C4	CLASS 1E 480 VAC LOADCENTER FOR CONTROL ROOM ESSENTIAL AHU	Open & Rack Out	1 minute
PGB-L34C3	CLASS 1E 480 VAC LOADCENTER FOR CONTROL ROOM ESSENTIAL AHU	Open & Rack Out	1 minute
PGB-L32E3	CLASS 1E 480 VAC LOADCENTER FOR PRESSURIZER BACKUP HEATERS BANK	Open & Rack Out	1 minute
PGA-L33D4	CLASS 1E 480 VAC LOADCENTER FOR PRESSURIZER BACKUP HEATERS	Open & Rack Out	1 minute
NGN-L11C4	CUBICLE FOR PRESSURIZER BACKUP HEATERS BANK RCE-B02	Open & Rack Out	1 minute
NGN-L11C2	CUBICLE FOR PRESSURIZER BACKUP HEATERS DIST PANEL RCN-D01	Open & Rack Out	1 minute
NGN-L11C3	CUBICLE FOR PRESSURIZER BACKUP HEATERS DIST PANEL RCN-D03	Open & Rack Out	1 minute
NGN-L12C4	CUBICLE FOR PROPORTIONAL HEATERS BANK RCE-B05	Open & Rack Out	1 minute
NGN-L12C2	CUBICLE FOR PRESSURIZER BACKUP HEATERS DIST PANEL RCN-D02	Open & Rack Out	1 minute
NGN-L12C3	CUBICLE FOR PRESSURIZER BACKUP HEATERS DIST PANEL RCN-D04	Open & Rack Out	1 minute
AFA-V006	AUX FEEDPUMP AFA-P01 CST SUCTION ISOLATION VALVE	Close / Open	5 minutes
AFA-V058	AUX FEEDPUMP AFA-P01 RMWT SUCTION ISOLATION VALVE	Unlock & Open / Close	5 minutes

EQID	DESCRIPTION	CYCLE POSITION	TIME TO OPERATE
AFB-V021	AUX FEEDPUMP AFB-P01 CST SUCTION ISOL VALVE	Close / Open	5 minutes
AFB-V028	AFB-P01 RMWT SUCTION HEADER ISOLATION VALVE	Unlock & Open / Close	5 minutes
CHN-V183	CHN-FSH-250 OUTLET	Close	1 minute
DGB-V013	JACKET WATER MAKEUP HDR ISOLATION	Ensure Close	1 minute
DGB-V025	JACKET WATER MAKEUP FROM CONDENSATE TRANSFER	Close	1 minute
DGB-V064	JACKET WATER MAKEUP SUPPLY VALVE	Close	1 minute
SSN-V819	SSN-HV-0015 BYPASS VALVE	Open / Close	1 minute

ELECTRONIC PROCEDURE CHANGE RECORD

Procedure No: 40DP-9ZZ04 **Revision No:** 005 **Category:** 1 2 [X] 3

Title: TIME CRITICAL ACTION (TCA) PROGRAM

Procedure Action: MAJOR MINOR [X] ADMIN. CORRECTION NEW SUPERSEDED CANCEL

NAD Review Required? YES NO [X] **Env Screening Req?** YES NO [X] **Expedited?** YES NO [X]

MRL Update? YES NO [X] **Full Basis Check?** YES NO [X] **Level of Use:** INFORMATION

EOP? YES NO [X] **PRG Concurrence Req?** YES NO [X]

10CFR50.59/72.48 REQ? YES NO [X] **50.59/72.48 DOC**

APPROVALS

Fuccillo, Carol (ZP2403)
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Date: 2010.12.15 12:21:43 -07'00'

PREPARER - SIGNATURE DENOTES THAT DOCUMENT IS READY FOR REVIEW AND APPROVAL AND PREPARER IS QUALIFIED IN SWMS AS PROCEDURE PREPARER

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Date: 2010.12.15 12:41:53 -07'00'

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NAD REVIEWER - (IF REQUIRED)

PRG CONCURRENCE - (IF REQUIRED) - SIGNATURE DENOTES PRG CONCURS WITH REVIEWER

1/7/2011

EFFECTIVE DATE/TIME

Myers, Mark D(Z70391)
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Reason: I am approving this document signing for Randy Merryman
Date: 2010.12.16 08:49:42 -07'00'

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Reason: Effective date change only.
Date: 2010.12.16 09:28:58 -07'00'

DESCRIPTION OF CHANGE

In support of the PVNGS Nuclear Administrative and Technical Manual (NATM) Procedure Replacement Project, procedure 40DP-9ZZ04, Time Critical Action Program, has been reformatted to comply with FrameMaker 9 Structured format for Administrative Procedures. The following PCRs have been incorporated:

PCR 3510485 - Time Critical Action changed from 60 minutes to 90 minutes. Changed NHMN-1903 to de-energize NCN-UV-99 to L35D2 to de-energize MCC M-19.

PCR 3511080 - Removed references that do not meet criteria of permanent or non-permanent quality records identifed in ANSI N45.2.9-1974 (or EPRI NP-5653).

REG. REVIEW

Applicability Determination performed by FUCCILLO*CAROL 11/30/2010

These changes are administrative in nature and do not establish an expanded definition of or alter the design of the facility, nor do they alter the method of operating or controlling the facility; therefore further regulatory review is not required per 93DP-0LC17, step 2.1.3.