17.4S Reliability Assurance Program

An introduction to the objectives of the Reliability Assurance Program (RAP) including Design Reliability Assurance (D-RAP) is provided in Section 17.3. This section discusses post certification D-RAP and the transition to reliability assurance activities during operations.

Reliability assurance activities are implemented in two stages. Stage 1 encompasses D-RAP conducted during certification of the ABWR (described in Section 17.3) and the D-RAP for STP site specific design including procurement, construction, fabrication and testing leading up to initial fuel load. D-RAP is largely accomplished for NINA by the NSSS vendor and the architect engineer. ITAAC are provided for D RAP in Tier 1 Section 3.6.

Stage 2 reliability assurance activities are conducted principally by STPNOC and commence during the transition to fuel load and plant operation and are implemented concurrently with and as part of the Maintenance Rule (MR) program described in Section 17.6S and the other programs described below. The MR program is implemented 30 days prior to fuel load.

Stage 2 reliability assurance activities continue for the life of the plant and with the MR program are implemented using traditional programs for surveillance testing, inservice inspection, inservice testing, the general preventive maintenance program and the Quality Assurance Program. These programs are collectively coordinated and results evaluated under STPNOC's broader program initiatives for Plant Health and the Equipment Reliability Process (ERP).

17.4S.1 Identification of Site-Specific SSCs for D-RAP

The process described in the reference ABWR DCD Appendix 19K to identify risk significant systems, structures and components (SSCs) for the certified and approved ABWR was also used for initial identification of the site specific, risk-significant SSCs during COLA preparation. This was accomplished using the generic ABWR probabilistic risk assessment (PRA) model revised to include site-specific information.

The initial list of site specific SSCs and their risk rankings is included in Appendix 19K. The PRA model for STP 3 & 4 will continue to be refined over the life of the plant and this will require periodic adjustment to the risk rankings of SSCs in Appendix 19K. Appendix 19K also includes the initial maintenance/testing recommendations for these SSCs to enhance reliability.

As D-RAP enters the detailed design, procurement, fabrication and construction phase, an expert panel with NINA representation will be established and utilized to:

- augment PRA techniques in the risk ranking of SSCs using deterministic techniques, operating experience and expert judgment
- identify risk significant SSCs not modeled in the PRA (if any)
- act as the final approver of risk significant SSCs

- recommend design changes where appropriate to reduce risk
- revise/adjust recommend operations phase maintenance/testing activities for risk significant SSCs described in Appendix 19K
- designate and chair NSSS and Architect engineer working groups as necessary to assist in accomplishing the objectives of the expert panel
- review and approve the recommendations of the working groups
- assess the overall station risk impact due to SSC performance and all implemented risk-informed programs (including D-RAP) after each plant-specific data update of the PRA.

The expert panel is made up of members with diverse backgrounds in engineering, operations, maintenance, risk and reliability analysis, operating experience and work control. During the D-RAP process STPNOC will provide operations and maintenance expertise. During the detailed design phase of D-RAP, each major engineering organization performing detailed design will be represented on the panel (or working groups) as deemed necessary. The composition of the panel will change during the period leading up to fuel load and operations. The panel will continue to function during operations for the life of the plant under the MR program.

The results of the expert panel system reviews, completed using the method described in FSAR Subsection 17.4S.1.4, are used to designate, at the system level, the site specific SSCs which have been determined to be risk significant and within the scope of the D-RAP process, and supplement the initial list included in Appendix 19K. In general, the categorization of a system is determined by the highest categorized system function, and the same categorization is given to all components in the system. The expert panel may further refine the system level categorizations at the component level, by categorizing components based on the supported system functions and identifying critical attributes for components determined to be safety/risk significant, using the method described in Subsection 17.4S.1.4. The listing of risk-significant systems/SSCs is documented for use in the Master Equipment Database (MED) (see Subsection 17.4S.1.2.1) or other quality record (see Reference 2) pending MED development.

17.4S.1.1 Organization

17.4S.1.1.1 Program Formulation and Organizational Responsibilities

As the ABWR design certification applicant, General Electric (GE) was initially responsible for formulating D-RAP (Reference 1). This initial formulation is retained (unchanged) in Section 17.3 and the results of implementation during certification are provided in DCD Appendix 19K.

NINA's overall organization for STP 3 & 4 is described in Part II, Section 1 of the STP 3 & 4 Quality Assurance Program Description (QAPD). In a manner analogous to formulation of the QAPD, NINA's Senior Vice President, Oversight and Regulatory

Affairs, is responsible for formulating the STP 3 & 4 reliability assurance activities as described herein.

D-RAP is fundamentally an engineering program. NINA's Vice President, Engineering and Construction and Project Director, retains responsibility for reliability assurance activities during design and construction even though implementation will reside principally with Toshiba and other NINA contractors responsible for completion of detailed design and the development of engineering and procurement specifications. NINA has delineated D-RAP requirements expected of the Plant Designer including participation on the expert panel. The organizational relationships of NINA and NINA contractors are further described in Section 1.8 of the QAPD. The response to COL License information item 19.26 also discusses Organization and Staffing to oversee design and construction.

For stage 2, the organizational emphasis will shift from Engineering and Construction to Systems Engineering and Maintenance Engineering under the Maintenance Rule program. STP design engineering will continue to play a role in maintaining the Master Equipment Database (see 17.4S.1.2.1), configuration control and application of the design change process if necessary to improve SSC reliability.

The D-RAP Expert Panel is composed of a Chairman and additional senior level managers as designated by the Vice President, Engineering and Construction and Project Director. The Expert Panel membership may be augmented as determined by the Vice President, Engineering and Construction and Project Director. Any change to the Expert Panel membership requires approval of the Vice President, Engineering and Construction and Project Director.

The Risk and Reliability Analysis organization maintains representation on the expert panel and has major input to determinations that SSCs are maintaining performance levels consistent with PRA model assumptions over the life of the plant. Risk and Reliability Analysis reports to the Senior Vice President, Oversight and Regulatory Affairs who maintains organizational independence and when necessary has unfettered access to NINA CEO and the Board of Directors in all matters related to quality assurance.

17.4S.1.1.2 Reliability Assurance Interface Coordination

Reliability assurance activity interface issues are coordinated through the expert panel since the organizations involved have representation on the panel. Specific interface responsibilities of the panel members are detailed in a controlling procedure. These interface responsibilities include the following:

- The Plant Designer panel member maintains the design interface to ensure that any proposed design changes that involve risk significant SSCs modeled in the PRA are identified and periodically reviewed with the expert panel at a frequency determined by the panel.

- The Plant Designer panel member maintains the design interface to ensure that any proposed changes resulting in an increase in the deterministically established

risk of an SSC not modeled in the PRA, are identified and periodically reviewed with the expert panel at a frequency determined by the panel.

- The Plant Designer panel member maintains the design interface to ensure that any proposed changes to the plant PRA model, as identified by NINA Risk and Reliability representative on the expert panel, are appropriately reviewed for design impact and the results of the review appropriately distributed throughout the Plant Designer's and subcontractor's organizations.

- The Plant Designer panel member coordinates with the design organizations and expert panel members to ensure that significant design assumptions related to equipment reliability are realistic and achievable.

- The Risk and Reliability Analysis panel member is responsible to inform the panel of changes to the PRA model and advise other panel members on the potential impact of the change on SSC risk rankings, assumed reliability of SSCs for design activities and the need for adjustments to the MR program.

17.4S.1.1.3 Risk and Reliability Organization Input to the Design Process

The Risk and Reliability Analysis panel member is responsible to review and concur in design changes involving risk significant SSCs identified by the Plant Designer's expert panel member.

During implementation of the MR program prior to fuel load, responsibility for design and configuration control will transition from the Plant Designer to STPNOC. STPNOC's procedure for Design Change Packages ensures screening of proposed design changes to identify Risk Management review and approval when necessary.

17.4S.1.1.4 Risk and Reliability Organization Design Reviews

The Risk and Reliability Analysis organization's participation in periodic design reviews is principally via the PRA configuration control program that incorporates a feedback process to update the PRA model. These updates fall into two categories:

- The plant operating update incorporates plant design changes and procedure changes that affect PRA modeled components, initiating event frequencies, and changes in SSC unavailability that affect the PRA model. These changes will be incorporated into the model on a period not to exceed 36 months.

- The comprehensive data update incorporates changes to plant-specific failure rate distributions and human reliability, and any other database distribution updates (examples would include equipment failure rates, recovery actions, and operator actions). This second category will be updated on a period not to exceed 48 months.

The PRA model may be updated on a more frequent basis.

17.4S.1.2 Design Control

17.4S.1.2.1 Configuration Control of SSCs

The initial focal point for configuration control as it relates to D-RAP is the list of SSCs and their risk rankings in Appendix 19K. During detailed design for STP 3 & 4, NINA will be adopting a process similar to that used in STP 1 & 2 for a Master Equipment Database (MED). During the detailed design phase, populating this data base for the risk significant SSCs identified in Appendix 19K will be performed by the Expert Panel or associated working groups. The MED will be developed and maintained as a source of approved risk information for the station. A high level overview of this process is shown in Figure 17.4S 1.

17.4S.1.2.2 Design Change Feedback

The design control and change processes provide feedback to the Risk Management organization via identification of components on the MED that are affected by a proposed change. Those affected SSCs with high risk are given additional review in accordance with approved criteria to ensure there is no potential impact to the risk ranking of the affected components. If potential impact is identified then the Risk and Reliability Organization must concur in the change.

17.4S.1.2.3 Design Interface with Risk and Reliability Organization

Assurance that SSC performance relates to reliability assumptions made in the PRA and deterministic methods for identifying risk significant SSCs is provided by monitoring the performance of SSCs during plant operation and the review and feedback of Operating Experience. This interface occurs through implementation of the Maintenance Rule and the functioning of the expert panel (see Figure 17.4S-1).

As a designed, constructed and operating evolutionary plant, the ABWR has available a wide range of traditional sources for relevant operating information. These include industry and vendor equipment information that are applicable and available to the nuclear industry with the intent of minimizing adverse plant conditions or situations through shared experience. Sources include the NRC (Information Notices and Generic Letters), INPO (EPIX, NPRDS, Operating Events, Significant Event Reports etc.) and vendor documentation and NSSS supplier information.

17.4S.1.2.4 Engineering Design Controls for SSC Identification

Engineering design controls applied for determining the SSCs within the scope of the RAP are generally those specified in 10 CFR 50, Appendix B, Criterion III, Design Control. These include for example the use of procedures for establishing risk via deterministic methods, proceduralized criteria for PRA risk ranking and independent verification and peer checking of the inputs necessary for utilization (or when necessary modification) of the site specific PRA model.

17.4S.1.2.5 Alternative Design

The process for proposing changes to the design for risk significant SSCs is proceduralized via NINA Design Change Package process. This process includes the use of a detailed check list to establish the impact of the change on the PRA or deterministic evaluations performed to establish risk for affected SSCs. Changes identified as having an impact on SSCs and their risk rankings require appropriate special or interdisciplinary reviews.

17.4S.1.3 Expert Panel

The expert panel and designated working group(s) consist of designated individuals having expertise in the areas of risk assessment, operations, maintenance, engineering, quality assurance, and licensing.

As a minimum, the combined expert panel and working group(s) include at least three individuals with a minimum of five years experience at similar nuclear plants, and at least one individual who has worked on the modeling and updating of PRAs for a minimum of three years.

When utilized, expert panel representatives from contractor design organizations are required to have a minimum of three years experience establishing risk rankings for nuclear plant SSCs using PRA or deterministic techniques (which may include Failure Modes and Effects Analysis).

17.4S.1.4 Methods of Analysis for Risk Significant SSC Identification

As discussed in Section 17.4S.1, the process described in Appendix 19K to identify risk significant SSCs for the certified and approved ABWR was also used for initial identification of the site specific, risk-significant SSCs during COLA preparation.

The process for maintaining, revising and when necessary establishing new risk rankings for modified design is based on PRA and deterministic techniques. The process utilized in categorizing components consists of the following major tasks:

- Identification of functions performed by the subject plant system.
- Determination of the risk significance of each system function.
- Identification of the system function(s) supported by that component.
- Identification of a risk categorization of the component based on probabilistic risk assessment (PRA) insights (where the component is modeled).
- Development of a risk categorization of the component based on deterministic insights.
- Designation of the overall categorization of the component, based upon the higher of the PRA categorization and the deterministic categorization.

- Identification of critical attributes for components determined to be safety/risk significant.

The PRA and deterministic methods are described more fully below.

17.4S.1.4.1 PRA Risk Ranking

A component's risk determination is based upon its impact on the results of the PRA. STP's PRA calculates both core damage frequency (CDF) and containment response to a core damaging event, including large early release frequency (LERF). The PRA models internal initiating events at full power, and also accounts for the risk associated with external events, including external flooding, seismic events, and fire, internal flooding, and events occurring during low power and shutdown. The PRA risk categorization of a component is based upon its Fussell-Vessely (FV) importance, which is the fraction of the CDF and LERF to which failure of the component contributes, and its risk achievement worth (RAW), which is the factor by which the CDF and LERF would increase if it were assumed that the component is guaranteed to fail. Specifically, PRA risk categorization to identify SSCs is based upon the following:

PRA Ranking	PRA Criteria
HIGH (Risk Significant)	FV $\geq$ 0.005 or RAW $\geq$ 2.0
LOW (Non-risk Significant)	FV < 0.005 and RAW < 2.0

17.4S.1.4.2 Deterministic Risk Ranking

Components are subject to a deterministic categorization process, regardless of whether they are also subject to the PRA risk categorization process. This deterministic categorization process can result in an increase, but not a decrease (from the PRA risk) in a component's categorization.

A component's deterministic categorization is directly attributable to the importance of the system function supported by the component. In cases, where a component supports more than one system function, the component is initially classified based on the highest deterministic categorization of the function supported. In categorizing the functions of a system, five critical questions regarding the function are considered, each of which is given a different weight. These questions and their weight are as follows:

Question	Weight
Is the function used to mitigate accidents or transients?	5
Is the function specifically called out in the Emergency Operating Procedures (EOPs) or Emergency Response Procedures (ERPs)?	5
Does the loss of the function directly fail another risk-significant system?	4
Is the loss of the function safety significant for shutdown or mode changes?	3
Does the loss of the function, in and of itself, directly cause an initiating event?	3

Based on the impact on safety if the function is unavailable and the frequency of loss of the function, each of the five questions is given a numerical answer ranging from 0 to 5. This grading scale is as follows:

"0" — Negative response

"1" — Positive response having an insignificant impact and/or occurring very rarely

"2" — Positive response having a minor impact and/or occurring infrequently

"3" — Positive response having a low impact and/or occurring occasionally

"4" — Positive response having a medium impact and/or occurring regularly

"5" — Positive response having a high impact and/or occurring frequently

The definitions for the terms used in this grading scale are as follows:

Frequency Definitions

- Occurring Frequently - continuously or always demanded
- Occurring Regularly - demanded > 5 times per year
- Occurring Occasionally - demanded 1-2 times per cycle
- Occurring Infrequently - demanded < once per cycle
- Occurring Very Rarely - demanded once per lifetime

Impact Definitions

- High Impact - a system function is lost which likely could result in core damage and/or may have a negative impact on the health and safety of the public
- Medium Impact - a system function is lost which may, but is not likely to, result in core damage and/or is unlikely to have a negative impact on the health and safety of the public

- Low Impact - a system function is significantly degraded, but no core damage and/or negative impact on the health and safety of the public is expected
- Minor Impact - a system function has been moderately degraded, but does not result in core damage or negative impact on the health and safety of the public
- Insignificant Impact - a system function has been challenged, but does not result in core damage or negative impact on the health and safety of the public

Although some of these definitions are quantitative, both of these sets of definitions are applied based on collective judgment and experience.

The numerical values, after weighting, are summed; the maximum possible value is 100. Based on the sum, functions are categorized as follows:

SCORE RANGE	CATEGORY
100–41	HIGH (Risk Significant)
40–0	LOW (Non-risk Significant)

A function with a low categorization due to a low sum can receive a higher deterministic categorization if any one of its five questions received a high numerical answer. Specifically, a weighted score of 15 or more on any one question results in an HIGH categorization. This is done to ensure that a function with a significant risk in one area does not have that risk contribution masked because of its low risk in other areas.

In general, a component is given the same categorization as the highest categorized system function that the component supports. However, a component may be ranked lower than the associated system function based upon diverse and/or multiple independent means available to satisfy the system function.

17.4S.2 Procurement, Fabrication, Construction, and Test Specifications

Procurement, fabrication, construction, and test specifications for safety-related and nonsafety-related SSCs within the scope of RAP are prepared and implemented under the approved QAPD referenced in Section 17.5S. The approved QAPD describes the planned and systematic actions necessary to provide adequate confidence that SSCs will perform satisfactorily in service. These actions are applied to procurement, fabrication construction and test specifications.

Assumptions related to equipment reliability and availability are translated into verifiable attributes, defined characteristics and processes and are included in procurement, fabrication, and construction specifications such that deviations from these attributes, characteristics and processes may be identified and corrected.

Procedures describing equipment selection require consideration of the manufacturer's recommended maintenance activities and the manufacturer's time estimates for accomplishing these activities such that the equipment selected is able

to meet availability assumptions while in service, including conservative allowances for unplanned maintenance.

Test specifications will describe to the extent practical the actual conditions that will exist when SSCs are called upon to perform their risk significant functions and testing will document proper performance under the specified conditions when these conditions can be practically established in the field. When these conditions can not be duplicated, acceptance will be established based on qualification testing performed by the equipment vendor under controlled conditions.

The approved QAPD, Part II, applies 10 CFR 50 Appendix B requirements to safety-related SSCs. For nonsafety-related SSCs within the scope of RAP, Part III, Section 1 of the QAPD describes the process for selectively applying program controls to those characteristics or critical attributes that render the SSC a significant contributor to plant safety.

Part III, Section 2 of the QAPD specifies the quality requirements required for nonsafety related SSCs credited in mitigating defined events such as Anticipated Transients Without Scram (ATWS) and Station Blackout (SBO). When SSCs are risk significant due to their role in mitigating these defined events then the specified quality requirements for these SSCs will be satisfied. For example the combustion turbine generator (CTG) is in the scope of the RAP due to its importance in reducing the risk associated with SBO. Therefore the CTG will also meet the procurement, test and test control quality requirements described in Regulatory Position 3.5, "Quality Assurance and Specific Guidance for SBO Equipment That Is Not Safety Related," and Appendix A, "Quality Assurance Guidance for Non-Safety Systems and Equipment," in Regulatory Guide 1.155, "Station Blackout."

17.4S.3 Quality Assurance Implementation

Implementation of the QAPD during procurement, fabrication, construction and preoperation testing of SSCs is accomplished in accordance with written instructions, procedures or drawings of a type appropriate to the circumstances and which, where applicable, include quantitative or qualitative acceptance criteria. These procedures are either NINA implementing procedures, or supplier implementing procedures governed by a supplier quality program approved by NINA.

17.4S.4 Maintenance Rule/Operational Programs

The STPNOC MR program is described in Section 17.6S. Risk significant SSCs identified by reliability assurance activities are included in the MR program as high safety significance (HSS) components (Section 17.6S.1.1.b). The opportunity to judge SSC performance under the MR program is provided by the operational programs discussed in 17.6S.3, "Maintenance Rule Program Relationship With Reliability Assurance Activities."

Many SSCs would meet the criteria to be in the MR program without considerations related to the RAP. In cases where the RAP identifies a high risk SSC that would not otherwise have been in the MR program, then the SSC is added. For those SSCs

already in the Technical Specifications (TS), Inservice Inspection (ISI), or Inservice Testing (IST) programs, their performance under these programs is factored into the performance monitoring accomplished under the MR program.

In cases where a SSC requires periodic testing or inspection not already accommodated by an existing program, then special provisions will be made to accommodate the necessary testing or inspection; for example in the Preventive Maintenance (PM) program.

17.4S.4.1 Performance Goals

Reliability performance assumptions for SSCs are established under the MR at two levels of performance monitoring. The first level of performance monitoring (MR (a)(2)) establishes conservative criteria used to judge that SSCs are meeting expected performance objectives. For SSCs the performance monitoring criteria are established consistent with the reliability and availability assumptions used in the PRA. Failure to meet these objectives would trigger performance monitoring at the second level (MR (a)(1)) accompanied by the establishment of specific defined goals to return the component to expected performance levels (Section 17.6S.1.3). These specific defined goals also consider the reliability and availability assumptions used in the PRA.

17.4S.4.2 Feedback of Actual Equipment Performance and Operating Experience

The feedback mechanism for periodically evaluating reliability assumptions based on actual equipment, train or system performance is realized in the implementation of the MR program. Since the performance monitoring criteria established under the MR program are set consistent with the assumed reliability assumptions used in the PRA, the failure to meet these performance objectives (i.e., equipment , train or system place in MR (a)(1) category) requires an assessment of the assumed reliability as described in 17.4S.4.1 above. This assessment requires that the assumed reliability be reviewed to ensure it is reflective of actual STP and industry performance. The STPNOC process requires review by the Risk Analysis organization to concur that goals have been met before moving a component from an MR (a)(1) status back to an MR (a)(2) status.

17.4S.5 Non-safety SSC Design/Operational Errors

The process for providing corrective actions for design and operational errors that degrade nonsafety-related SSCs within the scope of RAP is procedurally defined. All SSCs (safety-related or nonsafety-related) with risk significance other than LOW are entered into the MR program as HIGH. The STPNOC MR program does not distinguish between a Maintenance Rule Functional Failure (MRFF) and a Maintenance Preventable Functional Failure (MPFF). Therefore, nonsafety-related SSCs that have experienced a MRFF attributable to a design or operating error (i.e. could not have been prevented by maintenance) are corrected using the corrective action process described in the QAPD of Section 17.5S. Under the STPNOC MR program, MRFFs require cause determination (may be an apparent cause determination) and corrective action is implemented to prevent recurrence.

17.4S.6 Procedure Control

Implementation of the reliability assurance activities is considered an activity affecting quality and the controls for procedures and instructions used to implement reliability assurance activities are specified in Part II (safety-related) and Part III (nonsafety-related risk significant) of the QAPD. In most cases where a single procedure describes the process for an activity that applies to both safety-related and nonsafety-related components (for example establishing the performance monitoring criteria for the Maintenance Rule or establishing risk significance for SSCs in RAP) a single procedure or procedures that meet the full quality program requirements of Part II will be utilized. For activities such as procurement, nonsafety-related SSCs in the RAP will be governed by Procedure Controls meeting the requirements of Part III, Section 1 of the QAPD.

Part III, Section 2 of the QAPD specifies the quality requirements required for nonsafety-related SSCs credited in mitigating defined events such as ATWS and SBO. When SSCs are risk significant due to their role in mitigating these defined events then the specified quality requirements for these SSCs will be satisfied. For example the CTG is in the scope of the RAP due to its importance in reducing the risk associated with SBO. Therefore the CTG will also meet the procedure control quality requirements described in Regulatory Position 3.5, "Quality Assurance and Specific Guidance for SBO Equipment That Is Not Safety Related," and Appendix A, "Quality Assurance Guidance for Non-Safety Systems and Equipment," in Regulatory Guide 1.155, "Station Blackout."

17.4S.7 Records

Implementation of the reliability assurance activities is considered an activity affecting quality and the generation of records associated with this activity will meet the requirements of the QAPD Part II, Section 17 and Part III, Section 1.17.

Records of Expert Panel decisions and supporting documents are retained as QA records in the STP Records Management System (RMS) and consist of:

- Expert Panel decisions and meeting minutes including dissenting opinions and resolutions
- Recommendations of the working groups

Each PRA model includes two Reference Models for power operation and shutdown. For each Reference Model documentation is maintained that includes sources of input data, modeling techniques, and assumptions used in the analysis. These documents are maintained in RMS for the life of the plant.

Part III, Section 2 of the QAPD specifies the quality requirements required for nonsafety-related SSCs credited in mitigating defined events such as ATWS and SBO. When SSCs are risk significant due to their role in mitigating these defined events then the specified quality requirements for these SSCs will be satisfied. For example the CTG is in the scope of the RAP due to its importance in reducing the risk associated with SBO. Therefore the CTG will also meet the Records requirements described in

Regulatory Position 3.5, "Quality Assurance and Specific Guidance for SBO Equipment That Is Not Safety Related," and Appendix A, "Quality Assurance Guidance for Non-Safety Systems and Equipment," in Regulatory Guide 1.155, "Station Blackout."

17.4S.8 Corrective Action Process

Under the STPNOC process for MR implementation, any SSC experiencing a MRFF requires use of the Corrective Action process to document the failure, its cause determination and actions to preclude recurrence. As previously discussed in Section 17.4S.5, this also includes nonsafety-related SSCs.

Other failures of SSCs that are not MRFFs will be documented and corrected as described by the QAPD, Part II, Section 16 and Part III, Section 1.16.

Part III, Section 2 of the QAPD specifies the quality requirements required for nonsafety-related SSCs credited in mitigating defined events such as ATWS and SBO. When SSCs are risk significant due to their role in mitigating these defined events then the specified quality requirements for these SSCs will be satisfied. For example the CTG is in the scope of the RAP due to its importance in reducing the risk associated with SBO. Therefore the CTG will also meet the Corrective Action requirements described in Regulatory Position 3.5, "Quality Assurance and Specific Guidance for SBO Equipment That Is Not Safety Related," and Appendix A, "Quality Assurance Guidance for Non-Safety Systems and Equipment," in Regulatory Guide 1.155, "Station Blackout."

17.4S.9 Audit Plans

The reliability assurance activities are collectively accomplished by programs related to design, procurement, fabrication, construction, preoperational testing, PRA modeling and PRA risk assessment, deterministic evaluations from the expert panel, maintenance rule, Technical Specifications and other operational programs and the corrective action program. These programs are subject to audit as described in the QAPD.

Part III, Section 2 of the QAPD specifies the quality requirements required for nonsafety related SSCs credited in mitigating defined events such as ATWS and SBO. When SSCs are risk significant due to their role in mitigating these defined events then the specified quality requirements for these SSCs will be satisfied. For example the CTG is in the scope of the RAP due to its importance in reducing the risk associated with SBO. Therefore the CTG will also meet the audit requirements described in Regulatory Position 3.5, "Quality Assurance and Specific Guidance for SBO Equipment That Is Not Safety Related," and Appendix A, "Quality Assurance Guidance for Non-Safety Systems and Equipment," in Regulatory Guide 1.155, "Station Blackout."

17.4S.10 COL License Information

COL License Information Items 17.2, 17.3 and 17.4 are addressed as follows:

17.2 Policy and Implementation Procedures for D-RAP:

It is the policy of NINA to ensure that SSC reliability is properly considered and designed into the plant and is implemented through the reactor design, procurement, fabrication, construction, and preoperational test activities and programs. This policy is accomplished within the framework of the Quality Assurance Program Description (QAPD) including the development, approval and control of implementing procedures. Details are provided in Section 17.4S Reliability Assurance Program.

17.3 D-RAP Organization:

See Section 17.4S.1.1 for a discussion of the Organizational elements associated with D RAP and RAP during the Operations phase.

17.4 Provisions for Reliability Assurance during Operation:

The provisions for Reliability Assurance during Operations are described in Section 17.4S Reliability Assurance Program and 17.6S Maintenance Rule.

17.4S.11 References

17.4S.11-1 SECY 95-132, "Policy and Technical Issues Associated with the Regulatory Treatment of Non-Safety Systems (RTNSS) in Passive Plant Designs (SECY 94-084)," Attachment 2, Item E. Reliability Assurance Program.

17.4S.11-2 D-RAP Systems Review, May 25, 2011, STI No. 32962928.

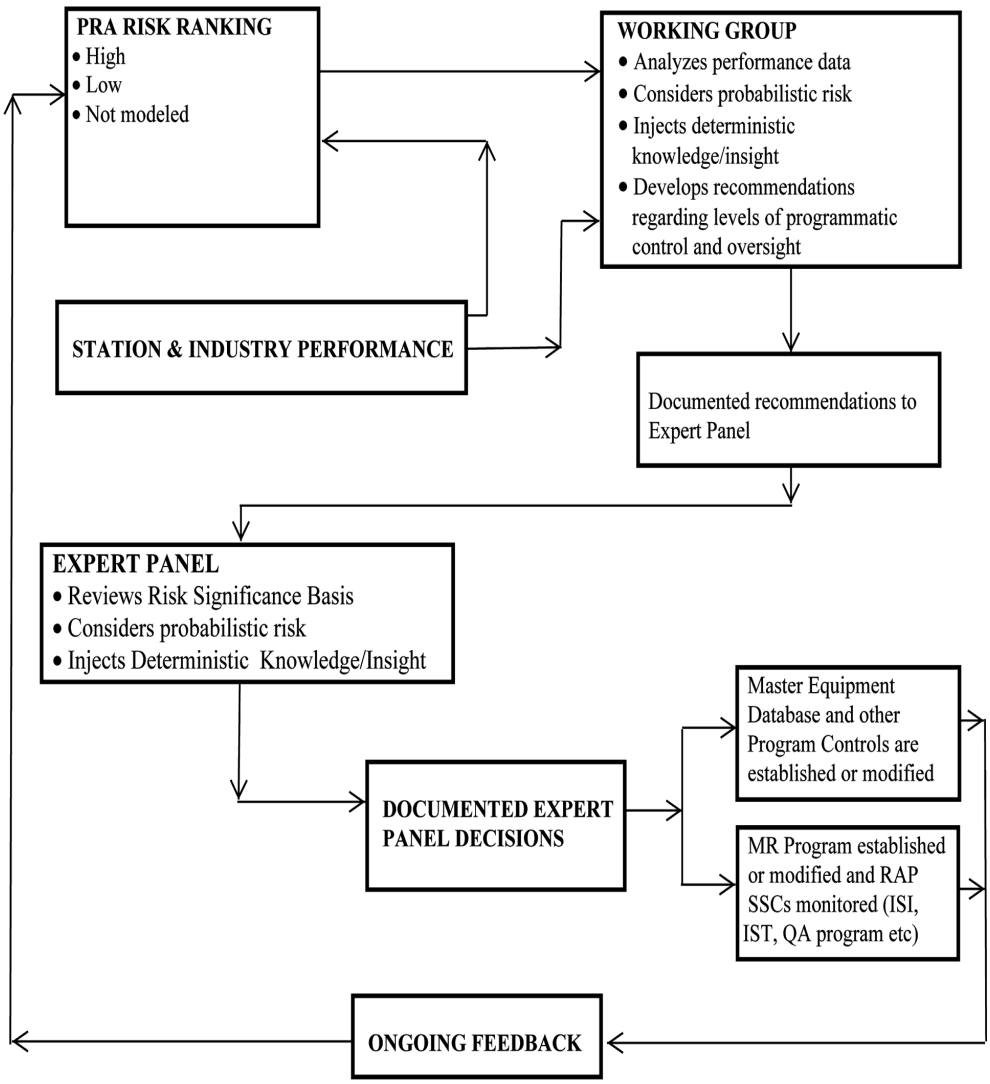

Figure 17.4S-1 Reliability Assurance Process

Note 1: Maintenance Rule program implemented 30 days prior to fuel load

Note 2: Working group(s) are chaired by an Expert Panel member