



UNITED STATES
 NUCLEAR REGULATORY COMMISSION
 REGION II
 101 MARIETTA STREET, N.W.
 ATLANTA, GEORGIA 30323

SEP 04 1992

Report No: 50-261/92-23

Licensee: Carolina Power and Light Company
 P. O. Box 1551
 Raleigh, NC 27602

Docket No.: 50-261

License No.: DPR-23

Facility Name: H. B. Robinson Nuclear Power Plant

Inspection Conducted: August 3 - 7, 1992

Inspector: TR Decker Jr 9/2/92
 R. P. Carrion Date Signed

Approved by: TR Decker 9/2/92
 T. R. Decker, Chief Date Signed
 Radiological Effluents and Chemistry
 Section
 Radiological Protection and Emergency
 Preparedness Branch
 Division of Radiation Safety and Safeguards

SUMMARY

Scope:

This routine, unannounced inspection was conducted in the areas of the organization of the Chemistry/Effluent Department and Radioactive Waste Group, plant water chemistry, the Post Accident Sampling System (PASS), the Control Room Emergency Ventilation System, the Annual Radiological Environmental Operating Report, the Meteorological Program, radioactive material processing and transportation, contingencies for long term storage of low level radioactive waste, records for decommissioning planning, and Information Notice (IN) 92-34.

Results:

The Chemistry Department and the Radwaste Group were staffed by knowledgeable, competent personnel. (Paragraph 2)

Plant water chemistry was maintained well within Technical Specification (TS) limits. (Paragraph 3)

The licensee was making progress in expanding the number of qualified technicians to operate the PASS. (Paragraph 4)

Records of testing required by the TSS for the Control Room Emergency Ventilation System were adequate and well maintained. The system itself showed no signs of physical degradation and was well maintained. (Paragraph 5)

The licensee had good programs in place to detect the radiological effects of plant operations. Those operations had caused minimum impact to the environment and virtually no dose to the general public. (Paragraphs 6)

The licensee's Meteorological Monitoring System was capable of fulfilling its required functions, was well maintained, and its records were in order. (Paragraph 7)

Radioactive material processing and shipping was conducted in a competent, professional manner. (Paragraph 8)

The licensee continued to evaluate contingencies for long-term storage of low level radioactive waste. (Paragraph 9)

The licensee will develop a system to identify and maintain events/incidents significant with respect to decommissioning planning. (Paragraph 10)

Information Notice 92-34, "New Exposure Limits For Airborne Uranium and Thorium," was discussed with the licensee. (Paragraph 11)

REPORT DETAILS

1. Persons Contacted

Licensee Employees

- *S. A. Billings, Technical Aide, Regulatory Compliance
- *R. H. Chambers, Plant General Manager
- *W. A. Christensen, Chemistry Supervisor, Environmental and Radiation Control (E&RC)
- *M. D. Crabtree, Radwaste Supervisor, E&RC
- *C. R. Dietz, Vice President, Robinson Nuclear Power Division
- *D. Dixon, Manager, Control and Administration
- *W. Dorman, Manager, Nuclear Assessment Department
- *J. A. Eaddy, Supervisor, E&RC Technical Support
- *W. T. Gainey, Manager, Plant Support
- R. R. Hitch, Senior Specialist, E&RC Support
- R. Slone, Records Management Supervisor
- *G. Walters, Acting Manager, Regulatory Compliance

Other licensee employees contacted during this inspection included engineers, operators, technicians, and administrative personnel.

NRC Inspectors

- L. Garner, Senior Resident Inspector
- *D. J. Roberts, Resident Inspector (Acting)

*Attended exit interview

Acronyms and Initialisms used throughout this report are listed in the last paragraph.

2. Organization (84750)

Technical Specification (TS) 6.2 describes the licensee's organization.

The inspector reviewed the licensee's organization, staffing levels, and lines of authority as they related to the Chemistry/Effluents Department and Radioactive Waste Group to verify that the licensee had not made organizational changes which would adversely affect the ability to control radiation exposures or radioactive material.

The Environmental and Radiation Control (E&RC) Unit consisted of the same number of people (fifty-nine plus one vacancy) as during the last inspection (92-10), conducted in April. However, it was organized into six functional areas (instead of five): Chemistry/Effluents, Radioactive Waste, Technical Support, and three (as opposed to two) groups for Job Coverage.

The Radioactive Waste Unit was composed of six (as opposed to seven) technicians and a supervisor, who reported to the E&RC Manager, who, in turn, reported to the Plant General Manager. Although the size of the group was reduced by one person, additional manpower was available upon request to assist in the completion of a specific radwaste-related activity. Also, some of the personnel in the Radioactive Waste Unit had changed due to normal rotation of assignments, but a core of experienced technicians remained in the unit. In addition to preparing the normal radwaste shipments, this group was also responsible for receiving the empty spent fuel casks from the Harris plant and assuring that they may be released from the Robinson site upon loading of the spent fuel, prior to transport to Harris.

The Chemistry/Effluents Unit had not changed at all since the previous inspection.

The inspector concluded that the licensee's E&RC organization and personnel therein were capable of effectively discharging their duties as related to Chemistry/Effluents and Radioactive Waste Management.

No violations or deviations were identified.

3. Plant Water Chemistry (84750)

At the time of this inspection, the unit had recently (less than six weeks earlier) completed its refueling outage and had begun its fifteenth fuel cycle. The next refueling outage is scheduled for September, 1993. The inspector reviewed the plant chemistry controls and operational controls affecting plant water chemistry since mid-June.

TS 3.1.6 specifies that the concentrations of dissolved oxygen (DO) and chloride in the Reactor Coolant System (RCS) be maintained below 0.10 parts per million (ppm) and 0.15 ppm, respectively, when the reactor coolant temperature exceeds 250 °F. TS 3.1.4 specifies that the total specific activity of the reactor coolant be limited to less than or equal to 1.0 microcuries/gram (uCi/g) dose equivalent iodine (DEI) under all modes of operation.

Table 4.1-2 of TS 4.1 specifies the sampling frequencies for these parameters. These parameters are related to corrosion resistance and fuel integrity. The oxygen parameter is established to maintain oxygen levels sufficiently low to prevent general and localized corrosion. The chloride parameter is established to provide protection from halide stress corrosion. The activity parameter is established to

minimize personnel radiation exposure during operation and maintenance.

Pursuant to these requirements, the inspector reviewed tabular daily summaries which correlated reactor power output to chloride and dissolved oxygen concentrations of the reactor coolant for the period of June 15, 1992 through July 31, 1992. Additional summaries for specific activity for the period were reviewed. The inspector determined that the parameters were maintained well below TS limits. Typical values for DO and chloride were less than 0.001 ppm (the LLD for the method of analysis used) and less than 0.020 ppm (the LLD for the method of analysis used), respectively. Typical Dose Equivalent Iodine (DEI) values at steady-state conditions were 3.0E-4 uCi/g.

There had been no evidence of leaking fuel since the unit returned to service following the refueling outage.

The inspector also observed a technician as he took a daily sample of the RCS for analysis and observed his activities during part of the analysis process. The technician closely followed Section 10.1, "Reactor Coolant System" of Chemistry Procedure CP-003, "Systems Sampling Procedure," Revision 12, effective January 14, 1992. The inspector noted that the technician was well-organized, used good health physics practices, and completed his assignment in a professional manner.

The inspector concluded that the Plant Water Chemistry was being maintained well within the TS requirements.

No violations or deviations were identified.

4. Post Accident Sampling System (PASS) (84750)

NUREG-0737 requires that the licensee be able to obtain a sample of the reactor coolant and containment atmosphere. Furthermore, the sample must be promptly obtained and analyzed (within three hours, total) under accident conditions without incurring a radiation exposure to any individual in excess of 3 and 18 3/4 rem to the whole body or extremities, respectively.

Criterion 2.a of the NUREG requires that a program be established, implemented, and maintained to ensure the capability to obtain and analyze, under accident conditions, reactor coolant, radioactive iodines and particulates in plant gaseous effluents, and containment atmosphere samples. The PASS should provide these capabilities and should enable the licensee to obtain information critical to the efforts to assess and control the course and effects of an accident.

The inspector discussed with the Chemistry Supervisor the status of the efforts to expand the pool of qualified technicians. The number of qualified technicians had remained unchanged (at five) since April 1992. The new Chemistry Procedure, CP-088, "Post Accident Diluted Liquid Sampling," had been drafted and was undergoing final engineering evaluations prior to approval. Its purpose was to detail the steps required to operate the PASS to obtain a liquid sample remotely. This procedure was the result of a decision to have two levels of qualification for the PASS, one which would allow a technician to take samples and do normal operations and another (higher) level which could trouble-shoot and maintain the system as well as do the normal operations. Approval of the new procedure was expected by the end of August and would be required training for all Chemistry Technicians. The training department had been contacted and technician qualification cards would be modified to reflect different levels of expertise upon approval of the procedure.

The inspector concluded that the licensee was making progress in improving the PASS and in expanding the number of qualified technicians to operate it.

No violations or deviations were identified.

5. Control Room Emergency Ventilation System (84750)

Per 10 CFR 50, Appendix A, Criterion 19, licensees shall assure that adequate radiation protection be provided to permit access to and occupancy of the control room under accident conditions and for the duration of the accident. Specifically, operability of the control room emergency ventilation system ensures that 1) the ambient air temperature does not exceed the allowable temperature for continuous duty rating for the equipment and instrumentation cooled by this system and 2) the control room remains habitable for operations personnel during and following all credible accident conditions such that the radiation exposure to personnel occupying the control room is limited to 5 rem or less whole body, or its equivalent.

TS 3.15 defines operability requirements for the control room emergency air cleanup systems under the various design scenarios. TS 4.15 establishes the surveillance requirements for the system.

The inspector reviewed Heating, Ventilation, and Air Conditioning (HVAC) Drawing G-190304, Sheet 4 of 4, Rev. 1, "HVAC - Turbine, Fuel, Auxiliary, Reactor, and Radwaste Buildings," which showed the general layout of the components of the Control Room Air Conditioning System for

Unit 2. The inspector walked down the system, from the air intake to the Control Room, to air exhaust, noting the major components, such as isolation dampers, filter banks, and fans as well as detectors for smoke, radiation, etc. All components were well maintained, with no sign of physical degradation. The inspector discussed system operation under both normal and emergency conditions with the cognizant system engineer.

The current system had been installed in late 1990, per Plant Modification M-994. The inspector reviewed summaries of the acceptance tests conducted before the system was deemed to be operational for High Efficiency Particulate Air (HEPA) filter testing and carbon adsorption, as required by TS, and determined that TS compliance had been met and the acceptance criteria satisfied. The most recent scheduled surveillance had been conducted during May, 1992 and had followed "Engineering Surveillance Test Procedure, EST-023, Control Room Emergency Ventilation System," Rev. 8, effective January 31, 1991. An unscheduled surveillance was done on July 25, 1992 due to painting activities in the Control Room area, as required by TS 4.15(d).

Based on the scope of this review, the inspector concluded that the System was adequate for its intended function and that it was being maintained in compliance with the applicable TSS.

No violations or deviations were identified.

6. Radiological Environmental Monitoring Program (REMP) (84750)

The purpose of the REMP is to measure any accumulation of radioactivity in the environment and to assess trends, to determine whether this radioactivity is the result of operations at the plant, and to assess the potential dose to the off-site populations based on the cumulative measurements of any plant-originated radioactivity via the monitoring of specific elements of exposure pathways, and to detect unanticipated pathways for the transport of radionuclides through the environment.

a. Annual Radiological Environmental Operating Report

TS 6.9.1.2.3 requires that the Annual Radiological Environmental Operating Report be submitted prior to May 1 of the following year of the Report. TS 6.9.1.2.3 also states format and content requirements for the Report.

The inspector reviewed the Report for calendar year 1991 to verify compliance with the TSS. The Report had

been submitted in compliance with TS 6.9.1.2.3 on April 21, 1992, and the format and contents were as prescribed by the TS. The inspector determined that the Report was in compliance with the TSSs.

Approximately 1150 samples of eleven different media types from indicator stations were collected, analyzed, and compared to over 140 control samples taken during the year. Detectable radioactivity attributable to plant activities was identified in eighteen measurements, less than two percent of the measurements. All detectable radionuclides in the environmental samples were less than reportable levels, as defined in the TSSs. Overall, the radiological environmental data indicated that plant operations in 1991 had no significant impact on the environment or public health and safety.

The Radiochemistry Laboratory at the Harris Energy and Environmental Center in New Hill, North Carolina, provides radioanalytical services for Carolina Power and Light's (CPL's) nuclear plant radiological environmental surveillance programs. The laboratory is a participant in the Environmental Protection Agency's (EPA's) cross-check program and uses its performance in the program as a major determinant for the accuracy and precision of its own analytical results. During 1991, a comparison of the laboratory's reported values with those of the EPA's known activity found 97 percent to be within three standard deviations. Specifically, one of 54 samples exceeded the three-sigma action level. A gross beta analysis of a water sample received in May 1991 fell outside the limit. Independent verification of the sample analyses was accomplished by reanalysis, the result of which was well within the known activity limits and, therefore, indicated a contamination problem from the beakers or planchets used in the initial sample analysis.

b. Comparison of State of South Carolina vs Robinson Results

The South Carolina Bureau of Radiological Health entered into a contractual agreement with the NRC to measure the concentrations of radioactivity and radiation levels in the environs of four nuclear power plants within the state, including Robinson. The principal objective of the contract is to provide reasonable assurance that environmental measurements made by NRC licensees are valid. To this end, the State of South Carolina:

- Coordinates sampling activities with those of the NRC licensees.
- Collects and analyzes environmental media samples.
- Takes appropriate action in the investigation of elevated levels of radioactivity in the environment.
- Participates in and reports results of the EPA's Intercomparison Studies Program.
- Reports the results of the State's and licensee's environmental radiological verification monitoring program.

The inspector compared several air particulate results for gross beta, surface water results for tritium, milk sample results for I-131 and K-40, and food crop (tomato) results for K-40, I-131, and Cs-137 as reported by the licensee to those listed in the "Nuclear Facility Monitoring Report" for 1991, submitted by the South Carolina Department of Health and Environmental Control. The results compared favorably. The inspector discussed the comparison with the Acting E&RC Manager.

The inspector concluded that the licensee had good programs in place to monitor releases of radiological effluents. Plant operations caused minimum impact to the environment and virtually no dose to the general public.

No violations or deviations were identified.

7. Meteorological Monitoring Program (84750)

The information obtained from the Meteorological Monitoring Program is integral to the determination of off-site dose projection. TS 6.9.1.3 requires an annual summary of hourly meteorological data collected over the previous calendar year, including wind speed, wind direction, atmospheric stability, and precipitation (if measured).

The inspector reviewed the Meteorological Monitoring Program at Robinson. The review included direct observation, discussions with a cognizant licensee representative, and a review of records. The inspector determined that Robinson had one meteorological tower, which was shared with microwave communications instrumentation. The tower had two sets of meteorological instrumentation, located at the 10- and 60-meter levels. Wind speed, wind direction, wind variance, and differential temperature were measured at both

levels. Total precipitation, solar radiation, and dew point instrumentation were located near ground level outside of the instrumentation shack. The program utilized two redundant systems; an ADAC System 1200, with a visual display readout of fifteen variables, and a Westinghouse system pulse counter, with four channels and a 36-day continuous-recording tape, which could be monitored from corporate headquarters. The ADAC System will become the primary system by approximately the end of the year.

The location of the tower was such that there would be no interference with the flow of air. In the event that the tower is out of service, there is no back-up system on the site. However, the essential parameters could be obtained from the nearby commercial airport of Florence, South Carolina. To date in 1992, data recovery of approximately 99 percent had been achieved.

The inspector verified by direct observation and by records review that the meteorological monitoring instrumentation channels were operable and maintained. The inspector reviewed selected portions of meteorological monitoring instrumentation channel calibration/verification records for the time period of October, 1990 to July, 1992. These calibrations/ verifications included the following instruments: wind speed and direction monitoring systems, the ambient temperature and differential temperature monitoring system, barometric pressure, and solar radiation instrumentation.

The inspector determined, through conversations with the cognizant licensee representative, that the calibration/ verification of the various meteorological instrumentation sensors were performed by personnel from the Meteorology Unit from CP&L's corporate office. Personnel from this unit perform six-, twelve-, and eighteen-week interim verifications, and semiannual and annual calibrations. The semiannual and annual calibrations included the change out of many of the monitoring systems (i.e. wind and temperature systems).

The inspector also checked the monitor in the Control Room to assure that the required meteorological parameters were available to the reactor operators. He found wind speed and wind direction at both 10- and 60-meter levels as well as differential temperature readings on the Group Display on the Plant Computer. In addition, the information could be obtained via a computer modem and dedicated telephone line to the tower. This system was demonstrated to the inspector.

Based on the scope of this review, the inspector determined that the Meteorological Monitoring System was capable of fulfilling its required functions.

No violations or deviations were identified.

8. Transportation (86750)

10 CFR 71.5(a) requires each licensee who transfers licensed material outside of the confines of its plant or other place of use, or who delivers licensed material to a carrier for transport, shall comply with the applicable requirements of the regulations appropriate to the mode of transport of DOT in 49 CFR Parts 170 through 189.

Pursuant to these requirements, the inspector reviewed the licensee's activities affiliated with these requirements, to determine whether the licensee effectively processes, packages, stores, and ships radioactive solid materials. The licensee's program for the packaging and transportation of radioactive materials was conducted by the Radwaste Group within the E&RC Department. Radwaste was processed and packaged (including the preparation of shipping documentation) by the Radwaste Group.

a. Radioactive Materials Shipment Documentation Packages

Shipment of radioactive materials was the responsibility of the Radioactive Waste Group, which prepared all shipping documents and procured the necessary disposal containers and shipping casks. Radioactive materials shipments were classified into four categories: Casks (for disposal at a burial site); Low Specific Activity (LSA) sent to Scientific Ecology Group, Inc. (SEG) for incineration and/or compaction prior to final disposal; Special Shipments (including virtually anything from spent fuel to samples containing Limited Quantities); and Laundry. The inspector reviewed five shipping documentation packages for radioactive materials shipments made since the last inspection (April 1992). They included one cask shipment, Shipment No. C-92-04, two LSA shipments to SEG, Shipment Nos. SEG-92-04 and SEG-92-05, and two Special Shipments, Shipment Nos. S-92-25 and S-92-26. The documentation packages were thorough and included shipment information such as unique shipment and shipping container numbers, waste content and volume, total activity, analytical summary and breakdown of isotopes with a half-life greater than five years, etc. The radiation and contamination survey results were within the limits specified by 49 CFR and the shipping documents were being maintained as required.

b. Observation of Preparations for a Spent Fuel Shipment

Since the first of the year, several rail shipments of spent fuel to the Shearon Harris Nuclear Power Plant (SHNPP) had been made. At the time of the inspection, another rail shipment was being readied. It consisted of two specially designed casks mounted on rail cars each containing seven spent fuel assemblies. The inspector observed portions of the preparations for loading one of the casks including lifting the cask from the decontamination area and placing it in the Spent Fuel Pool. The inspector reviewed selected sections of Spent Fuel Shipping Procedure SFS-001, Rev. 7, "IF-300 Shipping Cask Operations," effective March 5, 1992. The procedure provided instructions for the safe operation of the cask handling equipment and proper loading of the spent fuel casks. The procedure delineated the responsibilities of applicable work units, listed prerequisites, precautions and limitations, special tools and equipment required, and acceptance criteria, as well as detailing the activities required by the technicians. The supervisor and technicians carried out their responsibilities effectively and the cask was placed in the Spent Fuel Pool and its "head" was removed without incident. The inspector also observed the loading of several irradiated (spent) fuel assemblies into the fuel basket of the submerged cask using the spent fuel handling tool. The inspector noted that the technicians carefully followed procedures and employed good HP practices to minimize their exposure during the work evolution.

The inspector concluded that the Radwaste Group was staffed by competent personnel who effectively implemented the program.

No violations or deviations were identified.

9. Low Level Radwaste (LLW) Storage (84760)

The inspector requested an update on the contingencies being pursued by the Robinson management with respect to LLW long-term on-site storage.

a. Disposal Site Status

The governor of South Carolina, the South Carolina Budget and Control Board, and the South Carolina Department of Health and Environmental Control recommended keeping the Barnwell disposal facility open to regional and non-regional radwaste generators.

However, legislative action by the South Carolina General Assembly was required to extend the license and determine under what conditions and cost.

In late May, the General Assembly voted to extend the operating license for the disposal facility until December 31, 1995. During that period, the next host of the Southeast Compact will prepare a replacement facility.

b. Status of Robinson Contingencies

The inspector discussed the status of the plant's long-term LLW storage contingencies and plans, especially how they may have been affected by the extension of the operation permit of the disposal site, with the Radwaste Supervisor and other cognizant licensee personnel.

The licensee's Nuclear Engineering Department (NED) had commissioned a study to review alternative storage plans. The study had been given to the corporate staff in June 1992. It basically evaluated two alternatives:

- the establishment of one centralized storage facility for the three CPL nuclear sites.
- the establishment of storage facilities at each CPL nuclear site.

Corporate management was expected to make a determination in the near future about the issue. Then procedures would be written, plans developed, etc. such that if the storage capability became necessary at some future date, they could be activated and implemented rapidly.

The inspector concluded that the contingencies were appropriate and that the licensee's management was proceeding in a prudent manner.

No violations or deviations were identified.

10. Decommissioning Planning Records (84750)

10 CFR 50.75(g) requires that licensees maintain "records of information important to the safe and effective decommissioning of the facility in an identified location until the license is terminated by the Commission." Furthermore, information considered important by the Commission for decommissioning is identified as "records of

spills or other unusual occurrences involving the spread of contamination in and around the facility, equipment, or site" and that the records "must include any known information on identification of involved nuclides, quantities, forms, and concentrations." Also identified are "as-built drawings and modifications of structures and equipment in restricted areas where radioactive materials are used and/or stored and of locations of possible inaccessible contamination such as buried pipes which may be subject to contamination."

The inspector requested the licensee's decommissioning planning records to verify compliance with the regulations. Discussions with the licensee's Records Management Supervisor determined that the subject information was in the licensee's document control vault, in the form of microfiche and drawings. However, the records were not segregated into one readily identifiable area nor was a listing identifying pertinent information for decommissioning planning available.

Coincidentally, a meeting had been previously scheduled during the week of the inspection between the Records Management Supervisors of CPL's three nuclear plants to discuss this issue, among others. The discussions centered around the program in place at one of CPL's other nuclear power plants and the importance of its Records Task Force in determining the attributes/classification of a record. The licensee would evaluate and develop a system patterned after that system.

The inspector concluded that relevant decommissioning planning information was available onsite. However, timely retrieval and proper classification of documentation (both existing and future) was less than certain. This issue will be revisited during a future inspection.

No violations or deviations were identified.

11. Discussion of Information Notice (IN) 92-34

The inspector discussed IN 92-34, "New Exposure Limits For Airborne Uranium and Thorium," with the Chemistry Supervisor to be sure that he and his staff were cognizant of it and its implications. The IN emphasizes the two changes due to the NRC's adoption of the dose-assessment methodology recommended by the International Commission on Radiation Protection (ICRP) 26 and 30 in the new 10 CFR 20. These are significant changes in occupational exposure limits and equivalence of internal and external dose and could have great impact on licensees that experience airborne concentrations of uranium and thorium compounds.

12. Exit Interview

The inspection scope and results were summarized on August 7, 1992, with those persons indicated in Paragraph 1. The inspector described the areas inspected and discussed the inspection results, including likely informational content of the inspection report with regard to documents and/or processes reviewed during the inspection. The licensee did not identify any such documents or processes as proprietary. Dissenting comments were not received from the licensee.

13. Acronyms and Initialisms

CFR - Code of Federal Regulations
 Ci - curie
 CP - Chemistry Procedure
 CPL - Carolina Power and Light
 DEI - Dose Equivalent Iodine
 DO - Dissolved Oxygen
 DOT - Department of Transportation
 E&RC - Environmental and Radiation Control
 EPA - Environmental Protection Agency
 F - Fahrenheit
 g - gram
 HEPA - High Efficiency Particulate Air
 HVAC - Heating Ventilation and Air Conditioning
 ICRP - International Commission on Radiological Protection
 IN - Information Notice
 LLD - Lower Limit of Detection
 LLW - Low Level Radwaste
 LSA - Low Specific Activity
 μ Ci - micro-Curie (1.0E-6 Ci)
 NED - Nuclear Engineering Department
 No. - Number
 NRC - Nuclear Regulatory Commission
 PASS - Post Accident Sampling System
 ppm - parts per million
 RCS - Reactor Coolant System
 REMP - Radiological Environmental Monitoring Program
 Rev - Revision
 SEG - Scientific Ecology Group, Incorporated
 SHNPP - Shearon Harris Nuclear Power Plant
 TS - Technical Specification