UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

EVALUATION OF A REQUEST FOR EXTENSION OF PROVISIONAL CONSTRUCTION PERMIT NO. CPPR-95 SHOREHAM NUCLEAR POWER STATION DOCKET NO. 50-322

Introduction

Provisional construction permit CPPR-95 was issued to Long Island Lighting Company (the applicant, LILCO) on April 14, 1973, authorizing construction of the Shoreham Nuclear Power Station (the facility) on the north shore of Long Island in the town of Brookhaven, Suffolk County, New York. The construction permit specified May 1, 1979, as the latest date for completion of construction of the facility. By Orders dated May 14, 1979 and July 15, 1982, the latest completion date for CPPR-95 was extended to December 31, 1980 and March 31, 1983, respectively. The applicant subsequently requested that this date be further extended to December 31, 1983, in its letter of February 25, 1983 (SNRC-848).

Discussion

The applicant's letter (SNRC-848) stated that the delay in the completion of construction of the Shoreham Station was due to the following factors which were beyond the control of the Long Island Lighting Company:

1. An overall increase in required material quantities and manhours to complete the project.

2. Expanded scope of Regulatory requirements existing in late 1980 and/or difficulties in completion of these existing Regulatory requirements.

3. New Regulatory requirements (not know in late 1980).

4. Scope additions not due to Regulatory requirements.

5. Magnitude of System modifications (Regulatory and non-Regulatory).

6. Delays in the Startup Program.

7. Delays in material deliveries.

These factors are discussed below.

1. Overall Increase in Material Quantities and Manhour Requirements.

Since its last request for a Construction Permit (CP) extension projections of the material quantities and manhour requirements have increased substantially. The applicant reported that 4,500,000 more manual manhours will have been expended by fuel load than was projected in early 1981. These manhours will be used, among other things, to install 1.4 million feet of additional cable (a 37% increase), 600 more large bore and 2,200 more small bore pipe supports. This extra manhour expenditure equates to approximately one extra construction year and serves to illustrate the magnitude of the increase in material labor required to complete the plant.

2. Expanded Scope of Regulatory requirements Existing in Late 1980 and/or Difficulties in Completion of these Regulatory Required Modifications

a. ASME III Stress Reconciliation Modifications

The effort required to complete the Stress Reconciliation Modifications was much more extensive than previously estimated. Agreement between the staff and the applicant regarding the appropriate Mark II loads was not reached until late 1981, and the re-analysis program started in early 1982. The engineering manpower required was more than double the original estimate. This was due to changes in the input hydrodynamic loads, the degree of detail to which the stress reverification was performed, and the difficulties encountered in resolving the large number of stress analyses.

The late issuance of Engineering design documents associated with Stress Reconciliation (predominantly piping and pipe support modifications), coupled with a doubling of the magnitude of the impact 1,500 pipe support additions and modifications, instead of the originally estimated 700, has extended the completion schedule of this major effort to April of 1983. This Stress Reconciliation Program had compounding effects on the Startup Testing Program as some piping systems were delayed prior to flushing and pre-operational testing (e.g. the Structural Acceptance Test experienced delays due to the level of pipe support rework in the Primary Containment), and is still having an effect on the turnover of systems to the Plant Staff, even though pre-operational testing may be completed, since ASME III certification is required prior to this turnover process. According to the applicant, the Stress Reconciliation Program is the largest single contributor to the overall schedule slippage of the Shoreham project.

b. Post Accident Sampling System

The finalization of requirements by the staff for the Post Accident Sampling System, as well as design development delays and difficulties in obtaining equipment compatible with TMI requirements, produced significant delays in this facility. The system has only recently been completed and is under initial checkout.

c. Regulatory Guide 1.75 Electrical Separation Criteria

As conduit design and installation proceeded in 1981 and early 1982 (the peak design and installation period for Electrical Raceway), the available room for running conduit decreased and the difficulty of maintaining adequate separation increased accordingly. Conduit design and installation became a constraining activity on systems completion and contributed to the delay in the commencement of the Startup Test Program.

3. Impact of New Regulatory Requirements

a. Security System

A number of significant modifications to this sytem since late 1980 were required as a result of either direct NRC requirements (NRC Inspection Reports of November 1981 and July 1982), or as modifications developed by LILCO and its consultants to enhance system performance with respect to evolving Regulatory requirements in the Security area. In addition, design modifications to this system were required as late as February 1983 as a result of agreements entered into with Suffolk County in order to settle contentions pending before an Atomic Safety and Licensing Board. These last changes are only now being engineered and will have to be installed in the Plant prior to Fuel load.

b. Blockwall Modifications

As a result of NRC Bulletin 80-11, a structural re-evaluation of all seismic blockwalls in the plant was performed. This re-analysis resulted in steel reinforcing being added to all affected masonry walls at a cost of 35,000 manhours, with this work scheduled for completion in early April of this year. This work had to be performed in extremely congested areas, and the installation of the massive steel supports required impeded both construction and testing work in the areas affected.

c. NSSS Circuit Breaker Modifications

Final NRC review of Shoreham's electrical separation resulted in a requirement to add additional circuit breaker protection to a number of circuits on General Electric supplied control panels. These panels are currently in service, and therefore, the modifications required will entail electrical outages affecting pre-operation testing and plant surveillance testing activities. The Engineering associated with these modifications has just been completed and the field work is only commencing now.

d. Nitrogen Inerting System

Subsequent to November of 1980, LILCO committed to inert the Primary Containment, and this sytem which did not exist at all in Shoreham's original design, had to be engineered, procured, and installed. In addition to adding to the overall scope of the project, the interface requirements of the inerting system with Reactor ventilation and compressed air systems produced a secondary delaying effect on the completion, turnover, and pre-operational testing of those systems.

4. Scope Additions Not Due to Regulatory Requirements

a. Raceway Qualification Program

The Raceway Qualification Program currently ongoing at Shoreham was not conceived of until after the previous Construction Permit extension request. Over 200,000+ manhours have been allocated to this Program. Its final completion will not be achieved until May of this year due primarily to the extremely detailed nature of the final inspection and as-built documentation requirements.

b. Stress Corrosion Reduction Program

In 1981, LILCO decided to perform additional heat treatment of primary piping system welds which could be subject to Inter-Granular Stress Cracking (IGSCC). The IHSI process cost over 2,000,000+ dollars, and the field implementation of the program extended over a four week period in the summer of 1982. While originally scheduled to have a minimal impact on the overall Construction effort, it actually resulted in a four week delay in the critical Primary Containment schedule.

5. Miscellaneous System Modifications (Regulatory Required and Non-Regulatory Required)

Numerous system modifications resulting from Regulatory requirements, pre-operational testing findings, and "state-of-the-art" improvements, have been incorporated since late 1980. In the last year 71 individual design change packages were generated and have either been incorporated or are currently in the process of being installed. While not directly quantifiable as a schedule extension, these design changes contributed to the stretch-out of the construction schedule, to a delay in pre-operational testing, and to a delay in the final turnover of systems to the Plant Staff.

6. Delays in the Startup Testing Program

a. Diesel Generator Testing

Diesel Generator testing has been delayed for a number or reasons, including the replacement of failed parts; system modifications to improve performance; and completion of construction related to other systems in the diesel generator rooms.

While these matters have been resolved and the Diesel Generators are now entering their final phase of pre-operational testing, the delays up to this point have resulted in the Diesel Generators currently being the critical startup path to fuel load.

b. Service Water Pumps

The four safety related service water pumps experienced significant corrosion during their first year of operation, and all required extensive modification. In addition, the replacement of certain materials in the pumps still remains to be completed. This work remains to be accomplished prior to fuel load.

c. Radiation Monitoring System

Shoreham's Radiation Monitoring System is a "state-of-the-art" system and experienced numerous problems in its design, procurement, and testing. System interface modifications resulting from additional TMI (NUREG-0737) radiation monitoring requirements also impacted this system.

7. Delays in Material Deliveries

a. Electrical Cable

At the time of the last request for a Construction Permit extension, LILCO identified a shortage in electrical cable as a significant schedule restraining item. Significant delays in the delivery of electrical cable continued throughout 1981 and were only resolved late in that year. These delays can be seen by referring to section 1.

b. LPCI Motor Generator Sets

The unique performance requirement of these Regulatory required MG sets resulted in a one year delay in their delivery to the jobsite with an attendant delay not only in the testing of these individual components, but also in the final completion and testing of the LPCI safety injection valves to which these MG sets supply power.

c. Post Accident Sampling System Components

The Shoreham PASF is a "state-of-the-art" system with a number of components being delivered well after original schedule requirements called for. The chlorine analyzer for the PASF is still not on site and an alternate type of instrument (an ion chromatograph) is being substituted in its place.

d. Pipe Support Components

In 1981, significant delivery delays were experienced in the area of pipe support components (clamps, struts, snubbers, etc.) These delays decreased the efficiency of the overall effort and also, in some cases, resulted in system delays until at least a sufficient number of the pipe supports on the system could be installed.

Based on our review of the applicant's request, we find that the above factors were beyond the applicant's control and constitute good cause for the delay in completion of construction. Since the issuance of the Order extending the latest date for completion of construction to March 31, 1981, the applicant has maintained a construction effort at the Shoreham site and has revised the design of the facility to meet changing regulatory requirements. Based on our evaluation of the causes for the delay, we have determined that the requested extension is for a reasonable period of time.

As a result of our review of the Shoreham Final Safety Analysis Report to date and considering the nature of the delays, we have identified no significant hazards considerations in connection with the extension of the construction completion date. In addition, we find that the only change proposed by the applicant to the existing constructon permit is an extension of the latest completion date. This extension will not allow any work to be performed involving new safety information of a type not considered by a previous Commission safety review of the facility and that is not already allowed by the existing construction permit. Therefore, we find that (1) this action does not involve a significant hazards consideration, (2) prior public notice of this acton is not required, (3) there is reasonable assurance that the health and safety of the public will not be endangered by extension of the construction completion date, and (4) good cause exists for issuance of an Order extending the completion date.

Conclusion

Accordingly, issuance of an Order extending the latest completion date for construction of the Shoreham Nuclear Power Station to December 31, 1983 is reasonable and should be authorized.