VEPCO'S PROPOSED PROGRAM

MECHANICAL CLEANING & VALVE REPAIR

SERVICE WATER SYSTEM

NORTH ANNA POWER STATION

FEBRUARY 1985

TABLE OF CONTENTS

		Page
1.0	Description of the Service Water System & History	1
1.1	Discovery	2
1.2	Corrosion History	2
1.2.1	Cause of Corrosion	2
1.2.2	Attempts to Control Corrosion	3
1.2.2.1	1977 Program	3
1.2.2.2	1981 Program	4
1.2.2.3	1984 Program	4
1.3	Recent Actions Taken	4
1.3.1	Piping Replaced	5
1.3.2	Pipe Wall Testing	5
1.3.3	Chemical Treatment	6
2.0	Scope of the Project	7
2.1	Safety	7
2.1.1	UFSAR Design Basis	8
2.1.2	Alternatives	8
2.1.3	Technical Specifications	8
2.1.4	Historical Reliability	11
2.1.5	Header Isolations	12
2.1.6	Short Duration Isolations - Branch Headers	12
2.1.7	Total Isolation Time for Plan 4	13
2.1.8	Safety Review & Design Control	14
2.1.9	Status Board	14
2.1.10	Contingency Plans	15
2.2	Station Operation	19
2.3	Work Breakdown	19
2.3.1	Mechanical Cleaning	19
2.3.2	Valve Repair	21
3.0	Overall Project Approach	22
3.1	Option Chosen	22
3.1.1	Backup Plan	22
3.1.2	Basis for Choice	23

3.2 Project Scope 23

3.2.1 Identification of Pipe to be Cleaned 23
3.2.2 Engineering & Related Work 25
3.2.3 Definition of Work Packages 26

3.2.3.1 Grouping of Work Packages 26
3.2.3.2 Contents of Work Packages 30

3.3 Project Planning & Monitoring 33

3.3.1 Project Schedule 33
3.3.2 Detailed Work Package Schedule 33
3.3.3 Consolidated Flow Diagram 34
3.3.4 Management Reports 35

3.4 Interfaces with Other Activities 35

3.5 Generic Procedure 36

3.6 Project Team 39

Figure 1 - Service Water Flow Diagram

Figure 2 - Detail Work Package Schedule

Appendix A - Description of Work Packages

Appendix B - Options

Appendix C - Personnel Requirements, Responsibilities & Commitments

VEPCO PROPOSED PROGRAM

MECHANICAL CLEANING AND VALVE REPAIR

SERVICE WATER SYSTEM

NORTH ANNA POWER STATION

The purpose of this document is to provide background information with respect to the North Anna Power Station service water system corrosion problem, present the alternatives to resolve the problem and to present a program description to implement mechanical cleaning of service water system piping. Vepco intends to obtain the NRC's concurrence with the mechanical cleaning program so that work can begin and further corrosion of the service water piping can be arrested.

1.0 DESCRIPTION OF THE SERVICE WATER SYSTEM & HISTORY

The service water system is described in detail in the North Anna UFSAR (Section 9.2). Certain highlights are presented here as a summary of the system. The system provides cooling water to various components and systems within the power station. These include containment recirculation spray system, component cooling system, charging pump coolers, and the control room air conditioners. In addition, service water is provided as a backup supply to the steam generator feed system, the fuel pit coolers, penetration cooling coils and the recirculation air cooling coils. The service water system consists of two 100% capacity loops with four pumps providing supply to either loop. The system rejects the heat

energy through the 9 acre service water reservoir and spray array.

1.1 Discovery

In the fall of 1976, prior to the start up of Unit One, significant corrosion of the service water system was evident. Studies were performed to determine the corrosion mechanism and several actions taken as noted below.

1.2 Corrosion History

1.2.1 Cause of Corrosion

Studies have shown that two mechanisms are responsible for the corrosion. They are microbiological attack and the very aggressive water from Lake Anna which is the source of make up water for the service water system.

The biological attack is from three types of bacteria. Two of these types are iron fixing bacteria and the third type is a sulfate reducing bacteria. These bacteria form localized colonies which develop protective nodules. The bacteria are responsible for the pitting found in the piping which has resulted in pinhole leaks in some of the small bore piping in areas of relatively low flow.

The water is characterized as aggressive due to the lack of dissolved metals, low hardness, low alkalinity and neutral to slightly acidic pH. This means that the water is very anxious (aggressive) to dissolve anything it contacts, including iron pipe.

1.2.2 Attempts to Control Corrosion

As mentioned above, the corrosion problem has been known for a long time. Two attempts were made at controlling the corrosion by chemical means.

1.2.2.1 1977 Program

By letter dated April 29, 1977, Vepco informed the NRC of plans to chemically treat the service water system to clean the system of fouling and corrosion products and to prevent future fouling and corrosion. However, this program was discontinued due to the effect the chemicals had on the service water reservoir liner. The chemicals that were designed to disperse the corrosion products were picking up the clay liner as well and depositing the clay throughout the service water system and components. This resulted in restricted flow and reduced heat transfer. Once the chemical treatment was discontinued, the system was volume flushed

to remove the clay which restored flow rates and heat transfer. However, the treatment for the biological fouling was continued but was not as effective as hoped due to the protective nodules around the colonies of bacteria.

1.2.2.2 1981 Program

An independent consultant developed another chemical treatment program in 1981. This program was also found ineffective and abandoned.

1.2.2.3 1984 Program

A third program was implemented in 1984 which has proved effective on base metal. Test coupons have shown that corrosion has been reduced to less than 1 mil per year. The need for mechanical cleaning is based on the results of this program. Additional discussion of this program is found in section 1.3.3 of this report.

1.3 Recent Actions Taken

In response to the corrosion, certain actions have been taken. They include the replacing of pipe sections with pinhole leaks and renewed chemical treatment of the system.

1.3.1 Piping Replaced

Two sections of pipe have been replaced or placed on component cooling. Piping to the charging pump lube oil coolers and the service and instrument air compressors was replaced with stainless steel pipe. The 3 inch headers supplying the containment hot pipe penetration coolers were mechanically and chemically cleaned to remove corrosion product. Many of the 1/2 inch branch lines supplying individual penetration coolers were replaced due to flow blockage that could not be removed by cleaning. These lines were then placed on the component cooling water system which uses chromated water to insure that corrosion would not continue. Service water is still used as a backup supply for these subsystems.

1.3.2 Pipe Wall Testing

The remaining pipe has been examined to determine if there is adequate wall thickness to meet the UFSAR commitments and analysis. The UFSAR is based on minimum wall thickness of 87.5% of nominal wall thickness which takes into account standard manufacturing tolerances. It has been shown as a result of this testing that there is adequate strength to withstand both operational and design basis loads. As pointed out earlier, the failure of the piping from corrosion

has been due to pitting which results in pinhole leaks and not a general reduction of pipe strength. A surveillance program has been developed to periodically monitor pipe wall thickness and condition.

1.3.3 Chemical Treatment

In order to preserve the integrity of the remaining service water system piping, and thereby avert or postpone any requirement for further pipe replacements, a corrosion inhibitor chemical treatment program has been initiated. Corrosion inhibitor chemicals were added to the reservoir on July 13, 1984. The corrosion inhibitor is a molybdate-based chemical that has been effective in significantly reducing the corrosiveness of the service water. The Corrosion Inhibitor Chemical Treatment Program was developed for this particular application by Calgon Corporation and consists of the following chemicals:

a. Calgon TRC-256 Molybdate Solution Corrosion Inhibitor

b. Calgon CL-36 Surfactant Deposit Inhibitor

c. Calgon H-130 Microbiocide

These chemicals are used in addition to an existing hypochlorite treatment, which is used to control biological growth.

Carbon steel test coupons exposed to the treated service water for periods of up to 90 days have consistently experienced corrosion rates of less than 1 mil per year.

However, the treated service water cannot come in contact with the internal surface of a majority of the service water system piping due to the layer of corrosion product, silt and slime that has developed over the years of plant operation. In order for the corrosion inhibitor to be effective on service water piping, the internal surfaces must be cleaned to base metal. Until the piping is thoroughly cleaned, corrosion will continue to occur beneath the corrosion build up in spite of the presence of corrosion inhibiting chemicals in the service water.

2.0 SCOPE OF THE PROJECT

The scope of the project defines how the cleaning will be done. This scope includes safety considerations, continued operation of the two units, and requirements to properly and effectively perform the task.

2.1 Safety

2.1.1 UFSAR Design Basis

The safety function of the service water system is described and analyzed in the UFSAR (9.2.1). The system is designed to provide redundant service water such that no single failure of the system would compromise the safety of the two units.

2.1.2 Alternatives

Consideration was given to installing a third service water header. A permanent third header was investigated, and it was determined that there was not adequate room to locate a third 36" header and associated supports and missile protection within the station, and that the time required for installing the header was too long to allow immediate cleaning of the service water system. The use of a temporary header was also explored but was determined to be impractical and would not necessarily reduce the number of required isolations of permanent headers due to the need to tie into the existing equipment.

2.1.3 Technical Specifications

The system is required to operate in all modes of plant operation and under all accident conditions. Technical Specification 3/4.7.4 governs the operation of the system during operating Modes 1 through 4. Although the Technical Specifications do not require

two loops of the service water system to be operating in Modes 5 and 6, at least one loop must be operating in these modes to remove heat from the Residual Heat Removal system and fuel pool. Technical Specifications also govern the operation of several safety related components that are supplied by the service water system. The intent of the Technical Specifications, as related to this project, is to minimize the amount of time a safety related system is operated without redundancy of flow paths.

The Technical Specifications make provisions for system maintenance and modifications during operation by allowing one of the two redundant service water loops to be taken out of service for a period of 72 hours. The isolated loop must be placed back into service within 72 hours or both units must begin shutting down. Similar provisions are made in the Technical Specifications governing the operation of other safety related components and systems. The Technical Specifications do not put any limits on the number of times a particular system or component can be removed from service.

In a separate licensing action, Vepco is preparing a license amendment to change the Technical Specifications to extend the action statement time limit for the

service water system. However, due to the time required to get a license amendment processed, it was determined that the cleaning of the service water piping should proceed without delay. The license amendment to change the Technical Specification will proceed and will be utilized in the cleaning if made available before the cleaning is completed. The increase in the action statement time limit will reduce the number of times that the Technical Specification action statement will be entered into.

No exceptions or amendments to the Technical Specifications are being requested at this time. This submittal is provided because of the number of times the action statement will be entered and the time period between isolations.

Maintenance and repairs to the service water system and other safety related systems under Technical Specification action statement time constraints are performed as required in order to maintain safe and economical operation of the plant. An Action Statement Status Log (1-LOG-11) is maintained in accordance with Station Administrative Procedure 19.1 which documents each time an action statement is entered. The operational and safety consequences for each instance

are thoroughly reviewed prior to voluntarily entering an action statement.

The work described in this report has been carefully reviewed to insure that it can be accomplished safely with one or both North Anna units in operation. To minimize the number of times that Technical Specification action statements are involved, much of the work will be accomplished during planned single unit outages. Some of the work can be accomplished during one or two unit operation without impacting the Technical Specifications. Isolation of operating service water system loops or components will be done only when necessary and will be controlled using existing station Administrative Procedures. The duration of each period of isolation will be kept to a minimum. Discussion of the Technical Specification requirements for each work package is included with each package description in Appendix A, "Description of Work Packages".

2.1.4 Historical Reliability

A review of the Action Statement Log for prior years to 1978 shows that most entries into the action statement can be categorized as a periodic test failure or for the replacement of pipe due to pinhole leaks.

Therefore, based on past experience, we find the system to be very reliable.

2.1.5 Header Isolations

Most header isolations will be for the complete duration of the action statement time limit. The number of isolations varies with each of the plans described in Appendix B. The plan proposed by Vepco (i.e., Plan 4 in Appendix B) would result in six main header isolations and 16 branch header isolations. Ten of the 16 branch header isolations are of short duration as described below. The remaining isolations will be for most of the action statement time limit duration.

2.1.6 Short Duration Isolations - Branch Headers

One package (DCP 84-86) controls ten of the 16 branch header isolations. This package cleans the piping immediately adjacent to the component cooling heat exchangers. These branch line isolations are expected to be about five hours long in order to allow the removal of the valves connecting the heat exchangers with one header and the placement of flanges over the branch header opening. The approach here is to isolate one branch supply and return header; remove the valves connected to the

heat exchangers to be cleaned; place a flange over the header; and restore the header back to service. After approximately 5 hours with both headers in service, the other branch header will be isolated, valves removed, flanges installed and branch header then restored back to service. A heat exchanger can then be isolated and cleaned without being in a Technical Specification action statement. Once the cleaning is complete, the reverse operation will be performed to return the repaired valves in place. This procedure will be followed with each of the four component cooling heat exchangers. Total time for branch line isolation (i.e., entry into the Technical Specification action statement) is about 50 hours.

2.1.7 Total Isolation Time for Plan 4

A total of 18 separate header or branch line isolations are anticipated for this plan, ten of which should last less than five hours. The total time of isolation is estimated to be approximately 1,010 hours. These isolations will be spread over a time period of approximately 7,200 hours (10 months). Main or branch headers will be isolated approximately 14 percent of the total time during completion of the work. Each period of isolation required to complete pipe cleaning and valve repairs will be separated by a

minimum separation of 14 days of normal operation. However, half of the ten 5 hour long isolations required by work package DCP 84-86 will be separated by a period of approximately 5 hours. These periods of isolation will affect only the component cooling heat exchangers.

2.1.8 Safety Review & Design Control

Each work package will include a detailed review in accordance with the requirements of 10CFR50.59 to insure that the work does not create an an unreviewed safety question. A review of the operational safety implications will also be included in each package. These reviews will include requirements for precautions to be taken to minimize risks. All work packages will be approved by the Station Nuclear Safety and Operating Committee prior to initiation of any work related to that package.

2.1.9 Status Board

To aid the control room operators, a Service Water Status Board is planned. It will show in a concise and timely manner which lines, headers or components are isolated and which valves are removed for access to the pipe for hydrolasing. or which valves have been

removed for repair. In addition, temporary installations will be noted such as where flanges, spools or jumpers are installed.

2.1.10 Contingency Plans

Based on the design and performance history of the service water system, it is unlikely that a plant accident or component failure will occur during any period of main or branch header isolation that will render the unisolated header inoperable or that will require a site evacuation. However, should either of these events occur, quick action will be taken to restore the isolated header or branch line to a serviceable condition. Therefore, work packages that involve isolating main or branch headers will include an emergency contingency plan. Contingency plans will provide instructions for installing temporary devices such as spool pieces and pipe couplings to insure flow conditions. Temporary installations would be returned to normal status as soon as conditions allow.

These plans provide for restoration of service water to a component or subsystem in the unlikely event one of the following should take place during the time period that a header or portion of the service water system will be isolated:

a. Loss of Coolant Accident or other accident requiring service water to be operable;

b. failure of the remaining operating service water loop; or

c. flooding through the opened portion of the system as a result of operator error or valve failure.

For each system segment, a contingency plan for each of these events is addressed in Appendix A, "Description of Work Packages".

In general, these events are addressed as follows:

a. The Loss of Coolant Accident (or other accident requiring service water) is protected by the operational header; the isolated header will be restored to operation as soon as possible or within approximately two hours.

Where valves have been removed, blind flanges will be provided in those valve locations where flow through that valve is not necessary to meet the accident conditions. (See Appendix A, DCP 84-82 as an example.) Where flow of

service water through a removed valve is required, spool pieces will be provided for quick restoration of flow path. In both cases, once the flange or spool piece is in place, the header will be restored to service to provide the redundant service water supply.

b. Failure of the other or operational header is addressed by providing a temporary third supply of cooling water to the charging pump coolers which require cooling water immediately. Operation of non-essential equipment and components will be cut back to reduce heat load (such as Abnormal Procedure 15 for the component cooling heat exchangers). Under these conditions of reduced heat load, the component cooling system can tolerate a loss of service water flow for approximately 2 hours. The isolated header will be restored to service within approximately 2 hours utilizing flanges and spool pieces as described above.

c. Administrative controls to prevent flooding through an opened loop have proved successful in the past and will be relied upon in this event. These administrative controls include "tag-out" procedures. The "tag-out" procedures require the notification of the Shift

Supervisor, placement of a tag on the component (valves in this case) and tagging the components control room indicators and/or controlling switches. These procedures assure that tagged out valves will not be operated inadvertantly.

In addition to the normal tagging procedure described above, valves 18" diameter (Ø) and greater which are closed to provide main header isolation will be locked when there is a potential to flood the Auxiliary Building basement, emergency switch gear rooms or quench spray building basement. The locking of valves is included in work packages for Design Changes 84-76, 84-77, 84-82, 84-83, 84-84, 84-85, 84-86, 84-87, 84-88, 84-89, 84-96, 84-97, 84-98, 84-99, as described in Appendix A.

It should be noted that further administrative controls will complicate the restoration of the isolated header to service under emergency conditions and are not desirable.

2.2 Station Operation

It is desirable that any outage time for the sole purpose of the mechanical cleaning of the service water system be avoided. This can best be accomplished by the approach put forth here to assure that the cleaning is accomplished in the most effective, practicable and safe manner. The mechanical cleaning can be accomplished during normal station operation without compromising the safety of the station, station employees or the general public.

2.3 Work Breakdown

The first priority is to clean the system in as timely a manner as possible to allow the chemical treatment to protect the remaining pipe. To perform the work, information on the length of pipe to be cleaned, needed valve repairs, location, equipment and manpower requirements were compiled. These factors were taken into account in the definition of the 34 cleaning packages or sections as described in Appendix A. This appendix describes the location, boundaries, Technical Specification limitations and the contingency plan (for each of the three events described earlier) for each of the defined sections.

2.3.1 Mechanical Cleaning

Hydrolasing was chosen as the mechanical cleaning method because it is flexible, effective and is least likely to remove metal from the pipe wall.

Hydrolasing is a process whereby a high pressure (4,000 to 8,000 psi) water jet is directed at right angles to the internal surface of the pipe. The dislodged corrosion product is flushed out through an opening in the pipe. Waste products from the hydrolasing can be easily disposed of as described in section 3.2.3.2.

Hydrolasing is flexible in that both small and large sections of piping can be cleaned with only minor setup adjustments. Cleaning operations can be scheduled to comply with Technical Specifications. Hydrolasing performed previously at North Anna on small bore service water piping has been very effective in removing corrosion product build up from the pipe surface with no apparent metal removal.

Hydrolasing also has several economic advantages that makes it the preferred process for service water piping mechanical cleaning. The process is economical in that:

a. it will be accomplished by on-site construction personnel;

b. the equipment is already available on-site;

c. access requirements can be satisfied by relatively minor modifications, such as removing small sections of piping, valves, expansion joints or spools;

d. no special outages are required; and

e. waste products are easily handled and disposed.

Hydrolasing can also be accomplished without unplanned unit outages which requires purchase of replacement power.

2.3.2 Valve Repair

Operating experience has shown that some of the valves in the service water system do not provide tight shutoff. This failure to properly seat causes difficulties in isolating equipment for the cleaning operation. The majority of the valves that create isolation problems are flanged or wafer type butterfly valves.

The extent of the isolation problems are not known at this time. The three problems expected are:

a. buildup of corrosion product around the valve seating area;

b. corrosion attack of the cast iron butterfly valve disc; and

c. butterfly valve discs being "pulled through" their seats causing seat damage.

It is likely that a combination of all of these exists. Isolation problems are most prevalent with the butterfly valves. A conservative assumption is made that all of the butterfly valves have seating problems. It is also likely that some of the gate and check valves are also leaking through and will likewise require maintenance.

3.0 OVERALL PROJECT APPROACH

3.1 Option Chosen

After careful consideration of the options described in Appendix B, Vepco proposes proceeding under Plan 4. Work under Plan 4 begins with 72 hour action statements for branch line isolations, but it will utilize the extended action statement if the future proposed license amendment is approved as assumed.

3.1.1 Backup Plan

Should the future proposed license amendment for the extended action statement time limit not be granted by

the time main header isolations begin, Plan 3 will be implemented based on 72 hour action statements. Plan 3 and Plan 4 are identical until the main header isolations begin. Should the extension be granted after main header isolations begin, we will then shift to a modified Plan 4 for the remainder of the main header isolations.

3.1.2 Basis for Choice

The following reasons lead to the selection of Plan 4:

a. It accomplishes the mechanical cleaning with minimum impact on safety while continuing station operation.

b. It minimizes the number of main header isolations.

c. It allows for a fall-back to Plan 3 should the extension not be granted.

3.2 Project Scope

3.2.1 Identification of Pipe to be Cleaned

Service water system piping, 3 inch diameter and larger, will be hydrolased with the following exceptions:

a. The 4 inch diameter and smaller piping servicing the charging pump lube oil coolers and instrument and service air compressors. These lines have been replaced with stainless steel piping and do not require mechanical cleaning.

b. The 3 inch diameter and smaller piping servicing the containment penetration coolers. These lines have been switched over to the Component Cooling System under Design Changes 84-12 and 84-13.

c. The 36 inch diameter piping which has an internal coal tar epoxy lining.

d. The 24 inch diameter return lines in the service water pump house. This piping will be taken out of service once the new spray array is put into operation.

e. The 20 inch diameter piping between the service water pump discharge flanges and the 36 inch diameter main supply headers. This piping consists of all fittings which is much thicker than the system piping; and, since flow rates in this piping are high, corrosion is not a serious problem.

3.2.2 Engineering and Related Work

The project scope also includes all engineering and operations activities required to prepare implementation documents such as design change packages, valve repair procedures, engineering work requests, jumpers and temporary operating procedures.

In addition, minor modifications to facilitate main header draining, installation of a corrosion rate monitoring system and cross ties to eliminate stagnant areas will be included. The modification to the main header to facilitate draining consists of the addition of high point vents in the service water pump house. The corrosion monitoring system modification will include sixteen 2" taps with gate valves to which the monitoring system will be added at a later date. The cross ties to eliminate stagnant areas will consist of 3/4" lines with valves to provide flow to normally stagnant areas (such as auxiliary service water piping) to allow the chemicals to be effective in those areas.

The design and installation of temporary provisions for collecting, handling and disposal of waste product and recovery of residual service water are also included in the project scope of work as described in Section 3.2.3.2.

3.2.3 Definition of Work Packages

The Service Water System Mechanical Pipe Cleaning and Valve Repair Program has been broken down into 34 individual work packages. The boundaries for each work package are shown in Figure 1, Flow Diagram. A list of the work packages and a summary of the Scope of Work for each is included in Appendix A, Description of Work Packages.

3.2.3.1 Grouping of Work Packages

The work packages can be grouped into categories according to their relationship with station operating conditions and Technical Specifications. The work has been broken down in a manner that allows cleaning within the Technical Specification action statement time limits. The various categories are described as follows:

a. Category A - There are three work packages that can be accomplished during normal plant operation without entering into any Technical Specification action statement time period. This category includes portions of the control room air conditioning condenser cooling piping and portions of the auxiliary service water supply piping.

b. Category B - There are sixteen work packages that can be accomplished during normal plant operation within existing Technical Specification action statement time limits with one of the redundant service water main supply and return headers isolated. This category includes the main headers and lines that branch off of them up to the first isolation valve.

c. Category C - There are five work packages that can be accomplished during normal operation within existing Technical Specification action statement time limits with one redundant supply and return branch header to safety related components isolated. This category includes the branch lines to the component cooling heat exchangers and the charging pump gear box and seal coolers.

d. Category D - There are eight work packages that will be accomplished during single unit maintenance outages which are currently scheduled during

the Fall of 1985. This category includes the branch lines to the recirculation spray heat exchangers outside of the containment isolation valves.

e. Category E - There are two work packages that will be accomplished during single unit refueling outages that are currently scheduled during the Spring of 1986. This category includes the service water piping inside the containments that service the recirculation spray heat exchangers.

The estimated duration for the implementation of each work package under the proposed method of Plan 4 is shown on the project schedule which is included as Figure 4 of Appendix B. The time periods when the main and branch headers are isolated and Technical Specification action statements are in effect are highlighted. A total of four 72 hour-long and four extended main header isolations will be required to implement the six Category B isolations and four of the five Category C isolations, assuming that NRC approval of the extended action state-

ment request is obtained by September 1985. The fifth Category C work package will require that branch headers servicing the component cooling heat exchangers be isolated a total of 10 times with each period of isolation lasting approximately five hours. As shown on the schedule, all main and branch header isolations are estimated to occur over the 10 month period between April 1985 and January 1986. Based on the information presented above, it is estimated that total Technical Specification action statement time periods for both main header and branch header will be in effect for approximately 14 percent of the time during the cleaning period.

In general, Category A work packages will be implemented early in the project since no Technical Specification action statements are involved. Experience gained during the implementation of these packages will aid the detailed planning and implementation of those packages that will be completed under Technical Specification time constraints. Category B and C packages will be implemented beginning in April 1985 based on availability

of materials and work package documentation. Category D and E packages will be implemented as the appropriate plant outages occur.

All pipe cleaning and valve repair work will be accomplished using Design Change Packages prepared in accordance with the Vepco Nuclear Power Station Quality Assurance Manual and the Vepco Engineering and Construction Nuclear Design Control Program. Implementation of all work will be done in accordance with the applicable Station Administrative Procedures and Technical Specifications.

3.2.3.2 Contents of Work Package

A typical work package as described in Appendix A consists of all the activities required to isolate a specific section of piping, gain access to the inside of the pipe, hydrolase the internal surface of the pipe, repair or replace isolation valves, make modifications as required, perform required acceptance testing and return the system to operation.

In most cases access to the inside of the piping will be gained by the removal of flanged valves and expansion joints. However, in some of the smaller lines, access will be gained by temporarily cutting out a short section of the piping.

During all hydrolasing activities, provisions will be made for collecting and discharging corrosion product wastes. These provisions will consist of providing the following temporary installations:

a. Collection troughs to collect waste product

b. Settling drums to collect the heavier solids

c. Pumps and piping to transfer decanted waste water to the plant settling basin

The collected corrosion product will be drummed and disposed of as a non-hazardous waste.

The majority of valve repairs will involve the refurbishment of butterfly isolation valves. Typical repair activities will consist of disassembly of the valve, thoroughly cleaning the body and reassembly using new seats, stainless steel discs, packing, etc. In order to minimize the number of valves that must be refurbished during Technical Specification action statement time periods, replacement valves obtained from North Anna 3 and 4 stock will be used where possible. Valves that are replaced will be refurbished and reused in other work packages. Some gate and check valves may also require refurbishment.

Some work packages will include minor modifications which will improve corrosion control in stagnant areas of the system, allow the effectiveness of the corrosion inhibitor chemical treatment program to be monitored or improve techniques for draining the main service water headers.

3.3 Project Planning Monitoring

3.3.1 Project Schedule

Although this project is not critical to insure near-term operability of the service water system, it must be expedited to reduce the damage being done to the piping due to corrosion and thereby preserve long-term system integrity. As shown on the schedule in Figure 4 of Appendix B, the work packages are to be completed by the end of the June 1986 Unit 1 refueling outage. Schedule dates for completion of the outage related work will change if the scheduled outage dates change. Scheduled dates for performance of other categories of work packages will be revised as required to accommodate plant outages and operating requirements. Therefore, the dates shown on Figure 4 of Appendix B are to be considered preliminary. However, changes in the schedule due to revised outage dates will not cause an increase in the amount of time main or branch line headers are isolated. Other changes which result in increased header isolations will be submitted as a revision to this package.

3.3.2 Detailed Work Package Schedule

Prior to isolating any piping segment during a Technical Specification action statement for modifications,

hydrolasing or valve repair, a detailed hour by hour schedule will be prepared covering every activity to be performed during the period of isolation. A stop work point providing ample time for system closure and pressure testing will be included to insure that the 72 hour Technical Specification action statement is not violated. A sample of the detailed schedule is included as Figure 2. The sample is an actual schedule to be used during the implementation of work package DCP 84-73. Work will be subdivided into small enough portions to provide ample margin for completion within the allowable time limit. All equipment set-up will be completed and a thorough check-out of all equipment and tools performed prior to isolating the segment. Also, all personnel performing any portion of the work will be thoroughly briefed prior to start of work. Work will be performed around the clock with shifts overlapping to insure continuity.

3.3.3 Consolidated Flow Diagram

A consolidated flow diagram of the service water system has been prepared which cross references to erection control isometrics for each line to be hydrolased. Also, the diagram shows the boundaries of each work package. The flow diagram is included as Figure 1. This diagram will be used as an aid in

planning the work and for tracking project progress. In addition, status lists will be maintained providing status of hydrolasing and valve repair activities.

3.3.4 Management Reports

Vepco management will be kept informed as to the status of the project through weekly reports issued by Project Management Engineering. The NRC resident inspector will also be kept informed by station management of project status and any changes to the schedule that were required.

3.4 Interfaces with Other Activities

The performance of the mechanical cleaning and valve repair efforts affects and is affected by other service water system improvement projects.

Chemical cleaning of the service water piping is not feasible until the mechanical cleaning is complete and the redundant loops can be isolated from each other. Efforts to obtain the services of a chemical cleaning contractor must begin several months prior to the actual cleaning effort. This long lead time is required to request bids, analyze pipe samples, develop the cleaning process, obtain and review bids, develop and implement modification required to facilitate hook-up and to develop the required temporary operating procedures. The obtaining of pipe samples for evaluation by the prospective

chemical cleaning contractors will be accomplished under this project. The actual chemical cleaning process is not included in the scope of work for this project.

A permanently installed corrosion rate monitoring system is to be installed in the service water system piping. Piping modifications to install corrator probes and corrosion coupon holders will be required. These modifications will be implemented while their locations are isolated for hydrolasing and/or valve repairs to reduce the overall number of isolations required. The electrical hook up and commissioning of the monitoring system will be accomplished under a separate project.

3.5 Generic Procedure

In order to expedite the completion of this project, it is necessary to break the work down into numerous individual work packages. This is in lieu of preparing one all-inclusive package that would be cumbersome, would require considerable time to prepare and would require numerous revisions during the implementation process. Implementation of the work under individual packages will allow flexibility in planning the work effort to suit changes in circumstances.

The process of preparing individual work packages will be very similar in each case. The general process and procedure is described below:

a. A detailed walkdown of the piping segment to be hydrolased and/or valve to be repaired will be performed by the project team. Existing provisions for drainage, isolation, water recovery and access will be noted. Requirements for temporary or permanent modifications to provide the above will be determined. The waste collection and disposal scheme for that segment will be formulated.

b. Implementing procedures such as Design Change Packages, Engineering Work Requests, Temporary Operating Procedures, Mechanical Maintenance Procedures and/or jumpers will be prepared and submitted to the Station Nuclear Safety and Operating Committee (SNSOC) for approval.

c. Temporary installations not requiring system isolation will be installed and tested.

d. Required equipment will be set up and tested.

e. Personnel performing the work will be thoroughly briefed on the procedures, precautions, time constraints, work schedule and potential trouble spots. Personnel required to provide support during system isolation will also be briefed.

f. Materials and/or valve repair parts will be moved into work areas.

g. Connections for draining, etc or any other work that can be performed without system isolation will be completed.

h. Required tag reports and tags will be completed in accordance with the station Administration Procedures.

i. The piping segment will be isolated at which time the action statement will be entered in accordance with station Operating Procedures.

j. Piping segment will be drained and access points for hydrolasing opened as called for in the implementation documents.

k. Hydrolasing operation will be performed. At the same time, preparations will be made for system closure (weld end preparation, flange face preparation, etc).

l. Valve repairs will be made.

m. At a pre-determined time, even if hydrolasing has not been completed, system closure will begin.

n. Piping segment will be pressure tested as called for in the implementation documents.

o. The completed implementation documents will be reviewed and signed off by SNSOC.

p. The piping segment will be placed back into service and the tags removed.

q. Temporary installations will be removed.

In the event the entire piping segment is not cleaned during the period of isolation, portions of the procedure will have to be repeated at another time. As stated earlier in this report, the work has been broken down into small work packages in order to minimize the risk of not being able to complete the work within the allotted time period.

3.6 Project Team

To implement the mechanical cleaning and valve repairs, a Vepco Project Team consisting of Operations, Engineering and Construction personnel will be established. Full time involement by key personnel will be required. Part time support on an as requested basis will be required from certain departments. Support during periods of system isolation will be provided on a priority basis to insure that

the Technical Specification action statement is not violated. Project Team personnel requirements, responsibilities, and commitment requirements are provided in Appendix C.

Support from other departments such as estimating, cost and safety will be required. This support will be coordinated by the Project Management Engineer.

Installation of temporary and permanent modifications and hydrolasing and valve repair activities will be performed by Vepco Power Station Construction under the direction of the Project Team.

In order to insure project continuity, any changes in personnel will be made with individuals trained and qualified to perform their assigned tasks.

DOCUMENT/ PAGE PULLED

ANO. 8503070388

NO. OF PAGES 1

REASON

☐ PAGE ILLEGIBLE:

☐ HARD COPY FILED AT: PDR CF

OTHER _____

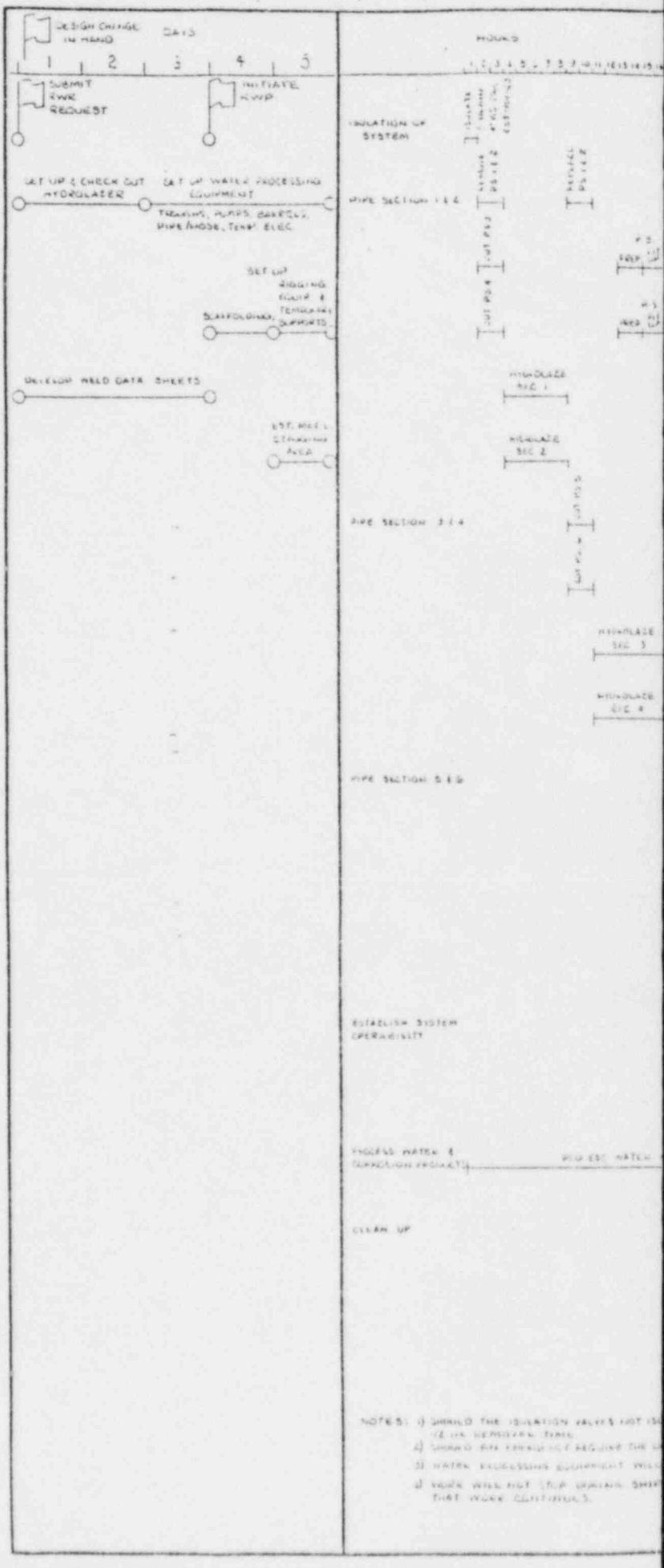
☐ BETTER COPY REQUESTED ON ____/____/____

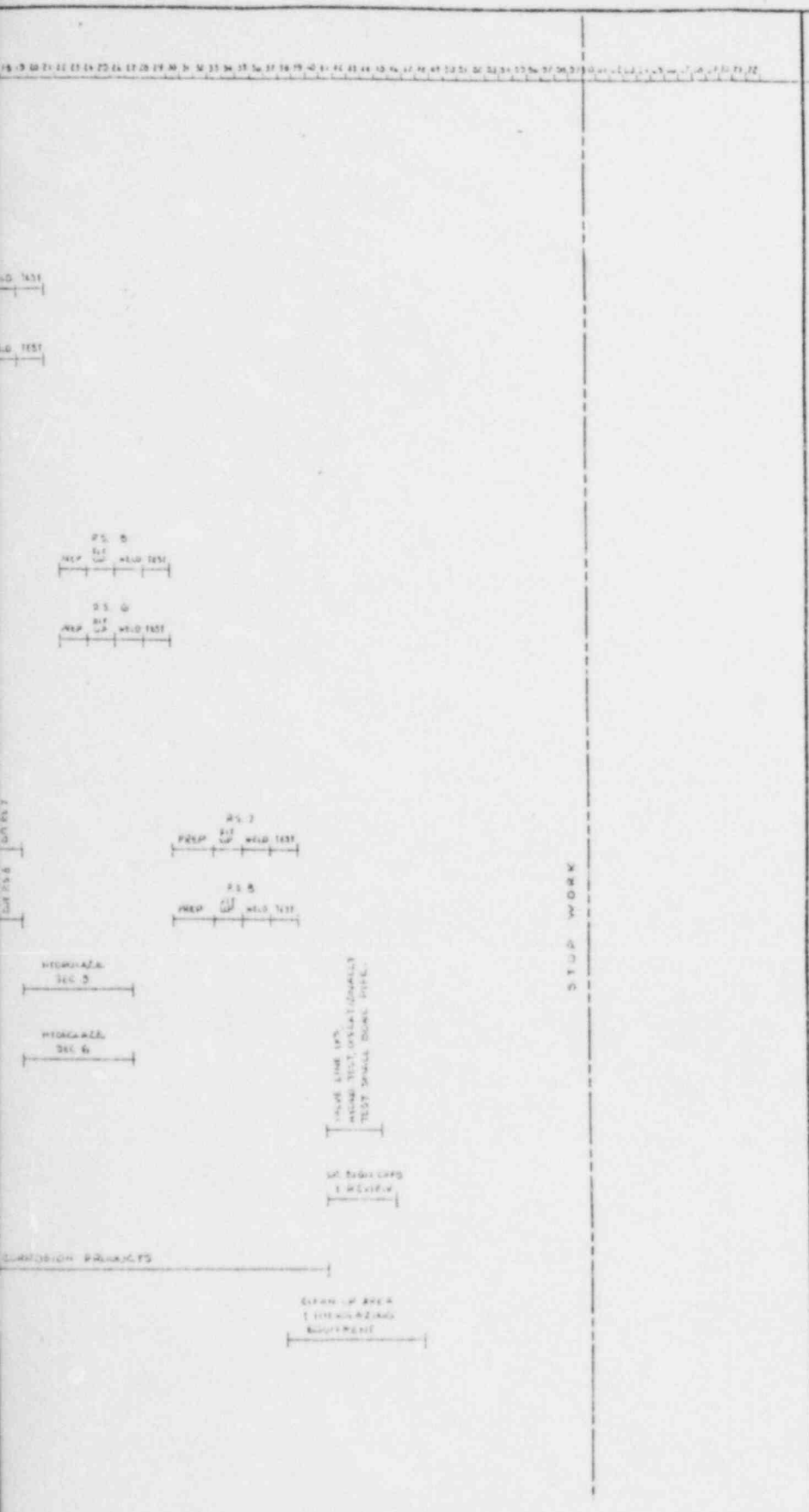
☐ PAGE TOO LARGE TO FILM.

☒ HARD COPY FILED AT: PDR (CF)

OTHER _____

☒ FILMED ON APERTURE CARD NO 8503070388-01


DESIGN CHANGE IN HAND
DAYS
1
2
3
4
5
HOURS
SUBMIT RWR REQUEST
INITIATE RWP
ISOLATION OF SYSTEM
SET UP & CHECK OUT HYDROLAZER
SET UP WATER PROCESSING EQUIPMENT
TRAILERS, PUMPS, BARRELS, HOSE & HOSE, TEMP ELEC.
PIPE SECTION 1 & 2
SET UP RIGGING EQUIP & SCAFFOLDING, TEMPORARY SUPPORTS
DEVELOP WELD DATA SHEETS
HYDROLAZE SEC 1
HYDROLAZE SEC 2
PIPE SECTION 3 & 4
HYDROLAZE SEC 3
HYDROLAZE SEC 4
PIPE SECTION 5 & 6
ESTABLISH SYSTEM OPERABILITY
PROCESS WATER & EVAPORATION PRODUCTS
CLEAN UP
NOTES:



VEPCO N.ANNA STATION		
E & C PLANNING DEPT.		
FIGURE 2		
DRAWN BY	HH	CONCPT DATE
PLAN APR		PREL ISS DATE
C ENGR APR		FINAL ISS DATE
CONST APR		IR NO.
PROJ MGR		PCN

APPENDIX A

Description of Work Packages

Mechanical Cleaning

Service Water System

North Anna Power Station

PIPING PRESERVATION PROJECT - HYDROLASING PLANNING SHEET

PIPE SEGMENT I.D.:	2 Type C
DESIGN CHANGE:	84-73
LOCATION:	Auxiliary Building Basement
PIPE LINE NUMBERS:	4"-C50 & C53
PIPE SEGMENT BOUNDARIES:	From Valves 694 & 678 to end of 4" lines at Charging Pump Gear Box and Seal Coolers.
REFERENCE DRAWINGS:	For Line C50 WS-2C50A Sheets 1 & 2, 2C50B, C & D; FM-22A and 22G. For Line C53 WS-2C52A Sheets 1 & 2, 2C52B, C & D; FM-22A and 22G.
ISOLATION REQUIREMENTS:	Lines: 4"-C50 and C53 Valves: 1-SW-694, 678, 682, 654, 659, 637, 642, 622, 628, 604 2-SW-610, 587, 593
PIPING MODIFICATIONS:	Remove three sections of pipe plus one spool piece per line. These sections will be restored to service without any changes.
VALVES TO BE REPAIRED:	None
LENGTH OF PIPE TO BE CLEANED:	Approximately 400' of 4"Ø Pipe

TECHNICAL SPECIFICATIONS:

Tech Spec 3.7.4.1 states "at least two service water loops (shared with the other unit) shall be OPERABLE", while either one or two units are in modes 1 through 4.

The action statement requires the restoration of two loops to OPERABLE status within 72 hours or be in at least hot standby within the next 6 hours and in cold shutdown within the following 30 hours. This action statement applies to both units and would require both units to take the same action should the system not be restored.

Work on this section will require isolating and draining of one branch supply header and one branch return header to the gear box and seal coolers, but will at no time isolate the main headers. The draining of the branch headers, the cleaning of the piping, and the restoration to operability will be completed within the 72 hour action statement. Time required to restore the headers into service will be monitored. Cleaning will stop at any point in order to provide adequate time to restore the headers. Once the headers are restored to OPERABLE status a review of the cleaning accomplished will be conducted and a determination will be made if additional header isolation and draining will be required in order to complete the cleaning addressed by this section. Additional draining is not anticipated due to margin provided in the detailed work schedule.

PLANS FOR COMPENSATORY ACTION:

Compensatory measures will be taken to maintain service water to the Charging Pump Coolers in the event that the operating supply or return or both are lost between the reservoir and the branch line's isolating valve while cleaning this segment. An alternate water supply and return will be made from the opposite main headers to the operating supply and return branch lines before starting this work.

PIPING PRESERVATION PROJECT - HYDROLASING PLANNING SHEET

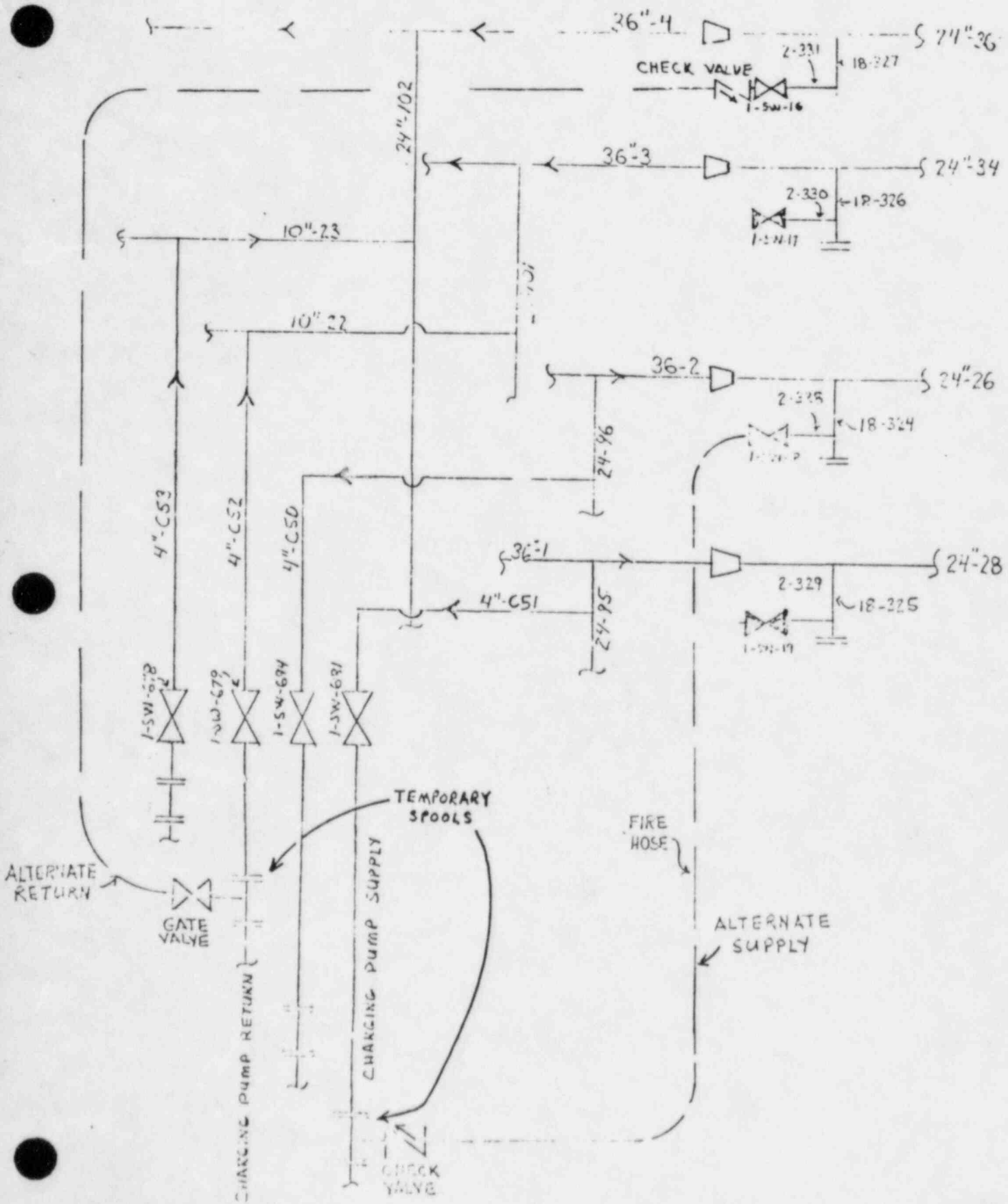
Fire hose will be connected from supply and return main header branch valves to temporary spool pieces per the attached sketch. Valves have been added to minimize the water from flowing out of any cuts or damaged sections in either fire hose. In order to bring either the alternate supply or return line into service, a readily accessible branch line isolating valve will be closed. In addition, Dresser couplings will be used to bring back into service the line being cleaned.

If a LOCA occurs during the 72 hour time period, the loop being cleaned will be brought back into service using the Dresser couplings. High radiation levels occur after one hour, which should be ample time to install the Dresser couplings and evacuate the area.

In the event that a 4" valve was inadvertently opened while cleaning the subject pipe segment would not flood critical equipment in the auxiliary building basement for 45 minutes. This is more than enough time to close any opened valve.

This work may be performed in conjunction with other Technical Specification related work, except for cleaning pipe segments 3, 5, 6, 7, 8, 9, 10, 11, 13, 14, 15, 16, 17, 18, 25, 26, 27 and 28.

EXAMPLE SKETCH 84-73



PIPING PRESERVATION PROJECT - HYDROLASING PLANNING SHEET

PIPE SEGMENT I.D.:	3 Type C
DESIGN CHANGE:	84-74
LOCATION:	Auxiliary Building Basement
PIPE LINE NUMBERS:	4"-C51 & C52
PIPE SEGMENT BOUNDARIES:	From valves 681 and 679 to end of four inch pipe charging pump gear box and seal coolers.
REFERENCE DRAWINGS:	For Line C51: WS-2C50A Sheets 3 & 4, 2C50B, C & D. For Line C52: WS-2C52A Sheets 3 & 4, 2C52B, C & D.
ISOLATION REQUIREMENTS:	4"-C51 and C52 only
PIPING MODIFICATIONS:	Temporary removal of three pipe sections and one spool piece per line.
VALVES TO BE REPAIRED:	None
LENGTH OF PIPE TO BE CLEANED:	Approximately 400' of 4"Ø Pipe

TECHNICAL SPECIFICATIONS:

Tech Spec 3.7.4.1 states "at least two service water loops (shared with the other unit) shall be OPERABLE", while either one or two units are in modes 1 through 4.

The action statement requires the restoration of two loops to OPERABLE status within 72 hours or be in at least hot standby within the next 6 hours and in cold shutdown within the following 30 hours. This action statement applies to both units and would require both units to take the same action should the system not be restored.

Work on this section will require isolating and draining of one branch supply header and one branch return header to the gear box and seal coolers, but will at no time isolate the main headers. The draining of the branch headers, the cleaning of the piping, and the restoration to operability will be completed within the 72 hour action statement. Time required to restore the headers into service will be monitored. Cleaning will stop at any point in order to provide adequate time to restore the headers. Once the headers are restored to OPERABLE status a review of the cleaning accomplished will be conducted and a determination will be made if additional header isolation and draining will be required in order to complete the cleaning addressed by this section. Additional draining is not anticipated due to margin provided in the detailed work schedule.

PLANS FOR COMPENSATORY ACTION:

Compensatory measures will be taken to maintain service water to the Charging Pump Coolers in the event that the operating supply or return or both are lost between the reservoir and the branch line's isolating valve while cleaning this segment. An alternate water supply and return will be made from the opposite main headers to the operating supply and return branch lines before starting this work.

PIPING PRESERVATION PROJECT - HYDROLASING PLANNING SHEET

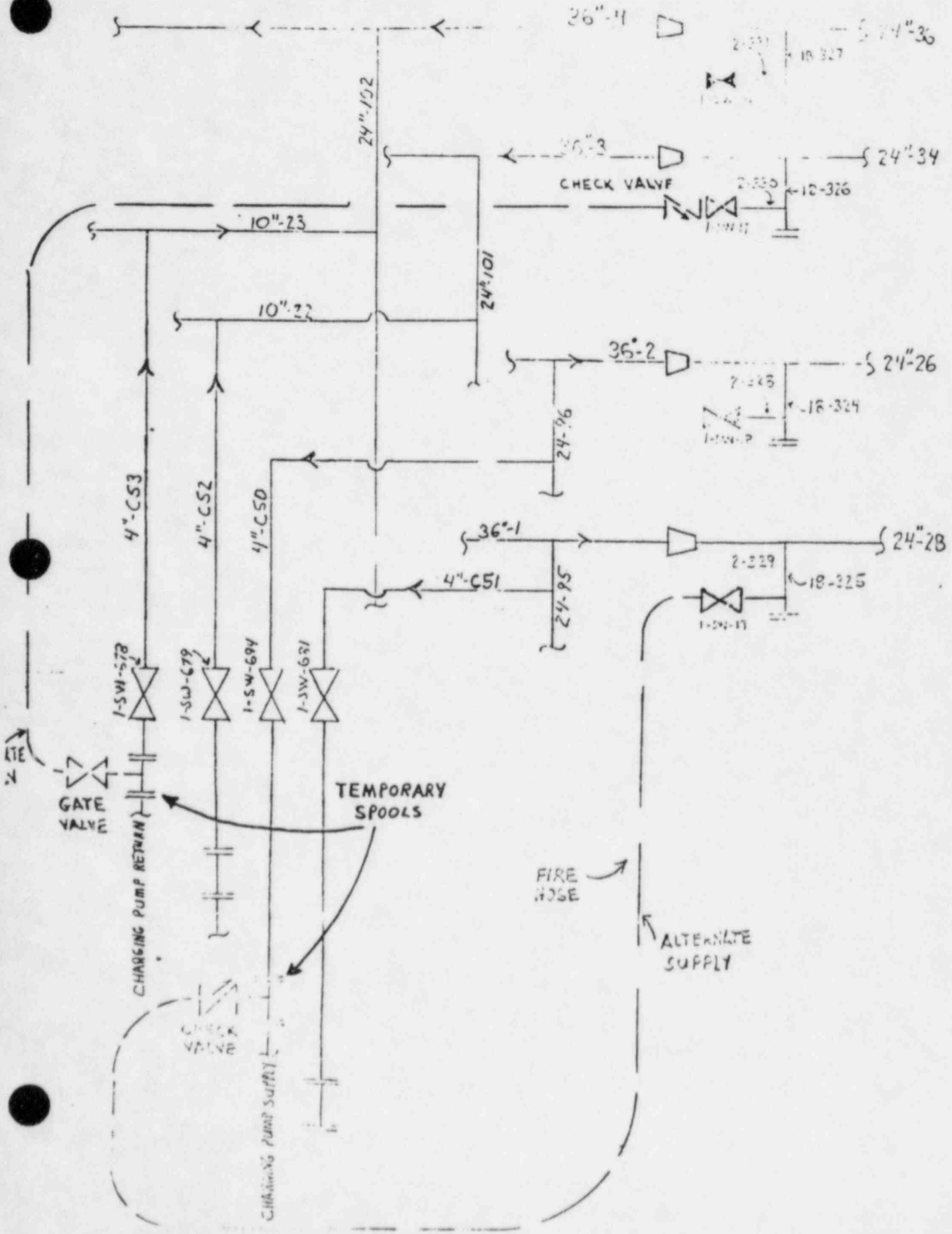
Fire hose will be connected from supply and return main header branch valves to temporary spool pieces per the attached sketch. Valves have been added to minimize the water from flowing out of any cuts or damaged sections in either fire hose. In order to bring either the alternate supply or return line into service, a readily accessible branch line isolating valve will be closed. In addition, Dresser couplings will be used to bring back into service the line opened for cleaning.

If a LOCA occurs during the 72 hour time period, the loop being cleaned will be brought back into service using the Dresser couplings. High radiation levels occur after one hour, which should be ample time to install the Dresser couplings and evacuate the area.

In the event that a 4" valve was inadvertently opened while cleaning the subject pipe segment would not flood critical equipment the auxiliary building basement for 45 minutes. This is more than enough time to close any opened valve.

This work may be performed in conjunction with other Technical Specification related work, except for cleaning pipe segments 2, 5, 6, 7, 8, 9, 10, 11, 13, 14, 15, 16, 17, 18, 25, 26, 27 and 28.

EXAMPLE SKETCH 84-74



PIPING PRESERVATION PROJECT - HYDROLASING PLANNING SHEET

PIPE SEGMENT I.D.:	4 Type A
DESIGN CHANGE:	84-75
LOCATION:	Turbine Building Basement
PIPE LINE NUMBERS:	Control Room A/C Condensers (no line numbers)
PIPE SEGMENT BOUNDARIES:	AC Condenser piping for Units 1 & 2 from 4" subsystem block valves to the condensers
REFERENCE DRAWINGS:	FM-22C, FB-26G, FB-26H, FB40 B & D
ISOLATION REQUIREMENTS:	Isolate one condenser at a time.
PIPING MODIFICATIONS:	None, valves, spools and flex hoses are to be removed for access.
VALVES TO BE REPAIRED:	None
LENGTH OF PIPE TO BE CLEANED:	Approximately 75' 3"Ø & 200' 4"Ø Pipe

TECHNICAL SPECIFICATIONS:

Tech Spec 4.7.7.1 requires that two air conditioning systems be OPERABLE. There are three 100% A/C chillers per system, removal of one chiller from service will not effect the operability of the other two chillers. Two air conditioning systems will always be OPERABLE. The operability of the two remaining chillers will be verified before work begins. No action statement will be initiated by work on this section.

COMPENSATORY MEASURES:

Compensatory measures are not required while performing this work, since it is non-Technical Specification related.

The potential flooding through a 4"Ø valve into the switch gear room shall be prevented by danger tagging the isolating valve in accordance with the Station Administrative Procedure.

PIPING PRESERVATION PROJECT - HYDROLASING PLANNING SHEET

PIPE SEGMENT I.D.:	5 Type B
DESIGN CHANGE:	84-76
LOCATION:	Auxiliary Building Basement
PIPE LINE NUMBERS:	10"-20; 10"-22 and others
PIPE SEGMENT BOUNDARIES:	From headers 24"-95 and 101 to first valves on lines 10"-20 & 22; 4"-46, 56, & C52
REFERENCE DRAWINGS:	WS-2B, WS-8B, WS-16A, WS-19A, WS-2C50A Sht 3, FP-5A, FP-5J, FP-21N
ISOLATION REQUIREMENTS:	Lines: 36"-1 & 3; 24"-95 & 101; 10"-20 & 22; 4"-46, 56, & C52
PIPING MODIFICATIONS:	None. Access through valves and spools.
VALVES TO BE REPAIRED:	MOV-113B, 113A
LENGTH OF PIPE TO BE CLEANED:	Approximately 15' of 3"Ø, 50' of 4"Ø, and 40' of 10"Ø Pipe

TECHNICAL SPECIFICATIONS:

Tech Spec 3.7.4.1 states "at least two service water loops (shared with the other unit) shall be OPERABLE."

The action statement requires the restoration of two loops to OPERABLE status within 72 hours or be in at least hot standby within the next 6 hours and in cold shutdown within the following 30 hours. This action statement applies to both units and would require both units to take the same action should the system not be restored.

Work on this section will require the draining of one main supply header and one main return header. The draining of the headers, the cleaning of the piping, and the restoration to operability will be completed within the 72 hour action statement. Time required to restore the headers into service will be monitored. Cleaning will stop at any point in order to provide adequate time to restore the headers. Once the headers are restored to OPERABLE status a review of the cleaning accomplished will be conducted and a determination will be made if additional header draining and isolation will be required in order to complete the cleaning addressed by this section.

PLANS FOR COMPENSATORY ACTION:

Compensatory measures will be taken to maintain service water to the Component Cooling Heat Exchangers and the Charging Pump Coolers in the event that the unisolated supply or return header fails while cleaning the off line loop for this segment. Alternate supply and return water lines will be provided to the Charging Pump Coolers before starting the work. Temporary spool pieces will be installed in the supply and return lines with a hose connected from the supply temporary spool piece to the fire protection supply, and a second hose from the return temporary spool piece to a main header return line. Valves have been added to prevent depressurizing the supply line and minimizing leakage on the return line due to cuts or damaged sections in the fire hose. This alternate supply water may be brought into service quickly by closing a branch line valve

and opening the fire valve. Closing a branch line valve and opening a small main header branch valve will allow using the alternate return line. If the service water is lost, the Station will initiate Abnormal Procedure 15 which will greatly reduce the heat load on the Component Cooling System. Based on conservative calculations, there is about 2 hours to bring a service water loop on line before the component cooling water temperature becomes critical. Within this time, the service water loop being cleaned will be brought back on line by installing prefabricated spool pieces. Construction personnel will be on location to perform any emergency installation.

In a LOCA event, the line being cleaned will be brought back on line by utilizing the prefabricated spool pieces.

The potential flooding from a 24"Ø opened valve into the auxiliary basement will be avoided by danger tagging all valves which are closed for isolation and locking all of these valves which are 18"Ø or greater in accordance with the Stations Administrative Procedures.

This work may be performed in conjunction with other Technical Specification related work, except for cleaning pipe segments 2, 3, 6, 8, 9, 13, 14, 15, 18, 26 and 28.

PIPING PRESERVATION PROJECT - HYDROLASING PLANNING SHEET

PIPE SEGMENT I.D.:	6 Type B
DESIGN CHANGE:	84-77
LOCATION:	Auxiliary Building Basement
PIPE LINE NUMBERS:	24"-96 & 102
PIPE SEGMENT BOUNDARIES:	From Headers 24"-96 and 102 to first valve on lines: 10"-21 & 23; 4"-47, 57, & C53
REFERENCE DRAWINGS:	WS-4B, WS-6B, WS17-A, WS-18A, WS-2C50A Sht 1, FP-5J, FP-21N
ISOLATION REQUIREMENTS:	Lines: 36"-2 & 4; 24"-96 & 102; 10"-21 & 23; 4"-47, 57, & C53
PIPING MODIFICATIONS:	Access through valves & spools. Add corrosion monitoring probes.
VALVES TO BE REPAIRED:	MOV-213A, 213B
LENGTH OF PIPE TO BE CLEANED:	Approximately 50' of 4"Ø and 40' of 10"Ø Pipe

TECHNICAL SPECIFICATIONS:

Tech Spec 3.7.4.1 states "at least two service water loops (shared with the other unit) shall be OPERABLE."

The action statement requires the restoration of two loops to OPERABLE status within 72 hours or be in at least hot standby within the next 6 hours and in cold shutdown within the following 30 hours. This action statement applies to both units and would require both units to take the same action should the system not be restored.

Work on this section will require the draining of one main supply header and one main return header. The draining of the headers, the cleaning of the piping, and the restoration to operability will be completed within the 72 hour action statement. Time required to restore the headers into service will be monitored. Cleaning will stop at any point in order to provide adequate time to restore the headers. Once the headers are restored to OPERABLE status a review of the cleaning accomplished will be conducted and a determination will be made if additional header draining will be required in order to complete the cleaning addressed by this section.

PLANS FOR COMPENSATORY ACTION:

Compensatory measures will be taken to maintain service water to the Component Cooling Heat Exchangers and the Charging Pump Coolers in the event that the unisolated supply or return header fails while cleaning the off line loop. Alternate supply and return water lines will be provided to the Charging Pump Coolers before starting the work on this segment. Temporary spool pieces will be installed in the supply and return lines with a hose connected from the supply temporary spool piece to the fire protection supply, and a second hose from the return temporary spool piece to a main header return line. Valves have been added to prevent depressurizing the supply line and minimizing leakage on the return line due to cuts or damaged sections in the fire hose. This alternate supply

water may be brought into service quickly by closing a branch line valve and opening the fire valve. Closing a branch line valve and opening a small main header branch valve will allow using the alternate return line. If the service water is lost, the Station will initiate Abnormal Procedure 15 which will greatly reduce the heat load on the Component Cooling System. Based on conservative calculations, there is about 2 hours to bring a service water loop on line before the component cooling water temperature becomes critical. During this time, the service water loop being cleaned will be brought back on line by installing prefabricated spool pieces. Construction personnel will be on location to perform any emergency installation.

In a LOCA event, the loop being cleaned will be brought back on line by utilizing the prefabricated spool pieces.

The potential flooding from a 24"Ø opened valve into the auxiliary basement will be avoided by danger tagging all valves which are closed for isolation and locking all of these valves which are 18" or larger in accordance with the Stations Administrative Procedures.

This work may be performed in conjunction with other Technical Specification related work, except for cleaning pipe segments 2, 3, 5, 7, 10, 11, 15, 16, 17, 25 and 27.

PIPING PRESERVATION PROJECT - HYDROLASING PLANNING SHEET

PIPE SEGMENT I.D.:	7 Type B
DESIGN CHANGE:	84-78
LOCATION:	Turbine Building Basement
PIPE LINE NUMBERS:	4"-466 & 468
PIPE SEGMENT BOUNDARIES:	Between 4" subsystem block valves and the main header lines (36" 1 & 3) during 72 hours
REFERENCE DRAWINGS:	WS-2A & 6C
ISOLATION REQUIREMENTS:	Lines: 36"-1 & 3, 4"-244 & 468
PIPING MODIFICATIONS:	Access through valves and temporary removal of pipe sections.
VALVES TO BE REPAIRED:	None
LENGTH OF PIPE TO BE CLEANED:	150' of 4"Ø Pipe

TECHNICAL SPECIFICATIONS:

Tech Spec 3.7.4.1 states "at least two service water loops (shared with the other unit) shall be OPERABLE."

The action statement requires the restoration of two loops to OPERABLE status within 72 hours or be in at least hot standby within the next 6 hours and in cold shutdown within the following 30 hours. This action statement applies to both units and would require both units to take the same action should the system not be restored.

Work on this section will require the draining of one main supply header and one main return header. The draining of the headers, the cleaning of the piping, and the restoration to operability will be completed within the 72 hour action statement. Time required to restore the headers into service will be monitored. Cleaning will stop at any point in order to provide adequate time to restore the headers. Once the headers are restored to OPERABLE status a review of the cleaning accomplished will be conducted and a determination will be made if additional header isolation and draining will be required in order to complete the cleaning addressed by this section.

PLANS FOR COMPENSATORY PLANS

Compensatory measures will be taken to maintain service water to the Air Conditioning, Component Cooling, and the Charging Pump Coolers in the event that the unisolated supply or return header fails while cleaning this segment. Provisions for alternate supply and return water lines will be established for the Charging Pump Coolers before starting this work. Fire hose will be connected to temporary spool pieces installed in the operating supply and return lines. The supply hose will be connected from the fire protection system and the return hose will connect to a small main header valve. Valves have been added to the temporary spool pieces to prevent depressurizing the supply line and minimizing leakage on the return line due to cuts or damaged sections in the fire hose. The alternate supply for the Charging Pump Coolers may be brought quickly into service by closing a Charging Pump Cooler branch line valve and opening the fire protection valve. Similar steps may be taken for the alternate return line should it

be necessary. The main service water header may be easily brought back into service by closing a 4" air conditioning isolating valve to avoid a significant rise in the component cooling water temperature. Once this segment's pipe sections are reinstalled using Dresser couplings, the air conditioning isolating valve may be opened which will bring the air conditioning system on line well within the 24 hour Tech. Spec. requirement.

If a LOCA occurs during the 72 hour time period, the air conditioning isolating valve will be closed on the segment being worked which will bring the isolated main header back on line. The air conditioning system may be down for 24 hours which will be sufficient time to go back and reinstall removed pipe sections utilizing Dresser couplings in a non-radiation area.

The potential flooding from a 4"Ø opened valve into the Chiller Rooms will be prevented by danger tagging all valves which are closed for isolation in accordance with Station Administrative Procedures.

This work may be performed in conjunction with other Technical Specification related work, except for cleaning pipe segments 2, 3, 6, 8, 9, 13, 14, 15, 26 and 28.

PIPING PRESERVATION PROJECT - HYDROLASING PLANNING SHEET

PIPE SEGMENT I.D.:	8 Type B
DESIGN CHANGE:	84-79
LOCATION:	Service Building Basement
PIPE LINE NUMBERS:	4"-467 & 469
PIPE SEGMENT BOUNDARIES:	From 4" subsystem block valves to 36" headers (see segment 7)
REFERENCE DRAWINGS:	WS-4A, WS-8C
ISOLATION REQUIREMENTS:	36"-2 & 4, 4"-467 & 469
PIPING MODIFICATIONS:	Access through valves and temporary removal of short pipe sections.
VALVES TO BE REPAIRED:	None
LENGTH OF PIPE TO BE CLEANED:	150' of 4"Ø Pipe

TECHNICAL SPECIFICATIONS:

Tech Spec 3.7.4.1 states "at least two service water loops (shared with the other unit) shall be OPERABLE."

The action statement requires the restoration of two loops to OPERABLE status within 72 hours or be in at least hot standby within the next 6 hours and in cold shutdown within the following 30 hours. This action statement applies to both units and would require both units to take the same action should the system not be restored.

Work on this section will require the draining of one main supply header and one main return header. The draining of the headers, the cleaning of the piping, and the restoration to operability will be completed within the 72 hour action statement. Time required to restore the headers into service will be monitored. Cleaning will stop at any point in order to provide adequate time to restore the headers. Once the headers are restored to OPERABLE status a review of the cleaning accomplished will be conducted and a determination will be made if additional header isolation and draining will be required in order to complete the cleaning addressed by this section.

PLANS FOR COMPENSATORY PLANS

Compensatory measures will be taken to maintain service water to the Air Conditioning, Component Cooling, and the Charging Pump Coolers in the event that the unisolated supply or return header fails while cleaning this segment. Provisions for alternate supply and return water lines will be established for the Charging Pump Coolers before starting this work. Fire hose will be connected to temporary spool pieces installed in the operating supply and return lines. The supply hose will be connected from the fire protection system and the return hose will connect to a small main header valve. Valves have been added to the temporary spool pieces to prevent depressurizing the supply line and minimizing leakage on the return line due to cuts or damaged sections in the fire hose. The alternate supply for the Charging Pump Coolers may be brought quickly into service by closing a Charging Pump Cooler branch line valve and opening the fire protection valve. Similar steps may be taken for the alternate return line should it be necessary. The main service water header may be easily brought back

into service by closing a 4" air conditioning isolating valve to avoid a significant rise in the component cooling water temperature. Once this segment's pipe sections are reinstalled using Dresser couplings, the air conditioning isolating valve may be opened which will bring the air conditioning system on line well within the 24 hour Tech. Spec. requirement.

If a LOCA occurs during the 72 hour time period, the air conditioning isolating valve will be closed on the segment being worked which will bring the isolated main header back on line. The air conditioning system may be down for 24 hours which will be sufficient time to go back and reinstall removed pipe sections utilizing Dresser couplings in a non-radiation area.

The potential flooding from a 4"Ø opened valve into the Chiller Rooms will be prevented by danger tagging the valves which are closed for isolation in accordance with Station Administrative Procedures.

This work may be performed in conjunction with other Technical Specification related work, except for cleaning pipe segments 2, 3, 5, 7, 10, 11, 15, 16, 17, 25 and 27.

PIPING PRESERVATION PROJECT - HYDROLASING PLANNING SHEET

PIPE SEGMENT I.D.:	9 Type B
DESIGN CHANGE:	84-80
LOCATION:	Service Building Basement
PIPE LINE NUMBERS:	4'-67 & 69
PIPE SEGMENT BOUNDARIES:	4" subsystem block valves to main headers (see segment 7)
REFERENCE DRAWINGS:	WS-4C, WS-8A
ISOLATION REQUIREMENTS:	36"-2 & 4, 4"-67 & 69
PIPING MODIFICATIONS:	Access through valves and temporary removal of short pipe sections.
VALVES TO BE REPAIRED:	None
LENGTH OF PIPE TO BE CLEANED:	220' of 4"Ø Pipe

TECHNICAL SPECIFICATIONS:

Tech Spec 3.7.4.1 states "at least two service water loops (shared with the other unit) shall be OPERABLE."

The action statement requires the restoration of two loops to OPERABLE status within 72 hours or be in at least hot standby within the next 6 hours and in cold shutdown within the following 30 hours. This action statement applies to both units and would require both units to take the same action should the system not be restored.

Work on this section will require the draining of one main supply header and one main return header. The draining of the headers, the cleaning of the piping, and the restoration to operability will be completed within the 72 hour action statement. Time required to restore the headers into service will be monitored. Cleaning will stop at any point in order to provide adequate time to restore the headers. Once the headers are restored to OPERABLE status a review of the cleaning accomplished will be conducted and a determination will be made if additional header isolation and draining will be required in order to complete the cleaning addressed by this section.

PLANS FOR COMPENSATORY PLANS

Compensatory measures will be taken to maintain service water to the Air Conditioning, Component Cooling, and the Charging Pump Coolers in the event that the unisolated supply or return header fails while cleaning this segment. Provisions for alternate supply and return water lines will be established for the Charging Pump Coolers before starting this work. Fire hose will be connected to temporary spool pieces installed in the operating supply and return lines. The supply hose will be connected from the fire protection system and the return hose will connect to a small main header valve. Valves have been added to the temporary spool pieces to prevent depressurizing the supply line and minimizing leakage on the return line due to cuts or damaged sections in the fire hose. The alternate supply for the Charging Pump Coolers may be brought quickly into service by closing a Charging Pump Cooler branch line valve and opening the fire protection valve. Similar steps may be taken for the alternate return line should it be necessary. The main service water header may be easily brought back

into service by closing a 4" air conditioning isolating valve to avoid a significant rise in the component cooling water temperature. Once this segment's pipe sections are reinstalled using Dresser couplings, the air conditioning isolating valve may be opened which will bring the air conditioning system on line well within the 24 hour Tech. Spec. requirement.

If a LOCA occurs during the 72 hour time period, the air conditioning isolating valve will be closed on the segment being worked which will bring the isolated main header back on line. The air conditioning system may be down for 24 hours which will be sufficient time to go back and reinstall removed pipe sections utilizing Dresser couplings in a non-radiation area.

The potential flooding from a 4"Ø opened valve into the Chiller Rooms will be prevented by danger tagging all valves which are closed for isolation in accordance with Station Administrative Procedures.

This work may be performed in conjunction with other Technical Specification related work, except for cleaning pipe segments 2, 3, 5, 7, 10, 11, 15, 16, 17, 25 and 27.

PIPING PRESERVATION PROJECT - HYDROLASING PLANNING SHEET

PIPE SEGMENT I.D.:	10 Type B
DESIGN CHANGE:	84-81
LOCATION:	Service Building Basement
PIPE LINE NUMBERS:	4"-66 & 68
PIPE SEGMENT BOUNDARIES:	4" subsystem block valves to main header (see segment 7)
REFERENCE DRAWINGS:	WS-2C, WS-6A
ISOLATION REQUIREMENTS:	36"-1 & 2, 4"-66 & 68
PIPING MODIFICATIONS:	Access through valves and temporary removal of short pipe sections.
VALVES TO BE REPAIRED:	None
LENGTH OF PIPE TO BE CLEANED:	220' of 4"Ø Pipe

TECHNICAL SPECIFICATIONS:

Tech Spec 3.7.4.1 states "at least two service water loops (shared with the other unit) shall be OPERABLE."

The action statement requires the restoration of two loops to OPERABLE status within 72 hours or be in at least hot standby within the next 6 hours and in cold shutdown within the following 30 hours. This action statement applies to both units and would require both units to take the same action should the system not be restored.

Work on this section will require the draining of one main supply header and one main return header. The draining of the headers, the cleaning of the piping, and the restoration to operability will be completed within the 72 hour action statement. Time required to restore the headers into service will be monitored. Cleaning will stop at any point in order to provide adequate time to restore the headers. Once the headers are restored to OPERABLE status a review of the cleaning accomplished will be conducted and a determination will be made if additional header isolation and draining will be required in order to complete the cleaning addressed by this section.

PLANS FOR COMPENSATORY PLANS

Compensatory measures will be taken to maintain service water to the Air Conditioning, Component Cooling, and the Charging Pump Coolers in the event that the unisolated supply or return header fails while cleaning this segment. Provisions for alternate supply and return water lines will be established for the Charging Pump Coolers before starting this work. Fire hose will be connected to temporary spool pieces installed in the operating supply and return lines. The supply hose will be connected from the fire protection system and the return hose will connect to a small main header valve. Valves have been added to the temporary spool pieces to prevent depressurizing the supply line and minimizing leakage on the return line due to cuts or damaged sections in the fire hose. The alternate supply for the Charging Pump Coolers may be brought quickly into service by closing a Charging Pump Cooler branch line valve and opening the fire protection valve. Similar steps may be taken for the alternate return line should it be necessary. The main service water header may be easily brought back

into service by closing a 4" air conditioning isolating valve to avoid a significant rise in the component cooling water temperature. Once this segment's pipe sections are reinstalled using Dresser couplings, the air conditioning isolating valve may be opened which will bring the air conditioning system on line well within the 24 hour Tech. Spec. requirement.

If a LOCA occurs during the 72 hour time period, the air conditioning isolating valve will be closed on the segment being worked which will bring the redundant main header back on line. The air conditioning system may be down for 24 hours which will be sufficient time to go back and reinstall removed pipe sections utilizing Dresser couplings in a non-radiation area.

The potential flooding from a 4"Ø opened valve into the Chiller Rooms will be prevented by danger tagging the valves which are closed for isolation in accordance with Station Administrative Procedures.

This work may be performed in conjunction with other Technical Specification related work, except for cleaning pipe segments 2, 3, 6, 8, 9, 13, 14, 15, 18, 26 and 28.

PIPING PRESERVATION PROJECT - HYDROLASING PLANNING SHEET

PIPE SEGMENT I.D.:	11 Type B
DESIGN CHANGE:	84-82
LOCATION:	Turbine Building Basement
PIPE LINE NUMBERS:	24"-25 & 58
PIPE SEGMENT BOUNDARIES:	Main header to first valves. (MOV-220A & MOV-115A)
REFERENCE DRAWINGS:	WS-9A, WS-9C, WS-9D
ISOLATION REQUIREMENTS:	24"-25 & 58
PIPING MODIFICATIONS:	Access through Valves. Add corrosion monitor probe.
VALVES TO BE REPAIRED:	1-MOV-220B & 115A
LENGTH OF PIPE TO BE CLEANED:	Approximately 100' of 24"Ø Pipe

TECHNICAL SPECIFICATIONS:

Tech Spec 3.7.4.1 states "at least two service water loops (shared with the other unit) shall be OPERABLE."

The action statement requires the restoration of two loops to OPERABLE status within 72 hours or be in at least hot standby within the next 6 hours and in cold shutdown within the following 30 hours. This action statement applies to both units and would require both units to take the same action should the system not be restored.

Work on this section will require the draining of one main supply header and one main return header. The draining of the headers, the cleaning of the piping, and the restoration to operability will be completed within the 72 hour action statement. Time required to restore the headers into service will be monitored. Cleaning will stop at any point in order to provide adequate time to restore the headers. Once the headers are restored to OPERABLE status a review of the cleaning accomplished will be conducted and a determination will be made if additional header draining will be required in order to complete the cleaning addressed by this section.

PLANS FOR COMPENSATORY ACTION:

Compensatory measures will be taken to maintain service water to the Component Cooling Heat Exchangers and the Charging Pump Coolers in the event that the unisolated supply or return header fails while cleaning the off line loop for this segment. Alternate supply and return water lines will be provided to the Charging Pump Coolers before starting the work. Fire hose will be connected to temporary spool pieces installed in the operating supply and return lines. The supply hose will be connected from the fire protection system and the return hose will connect to a small main header valve. Valves have been added to the temporary spool pieces to prevent depressurizing the supply line and minimizing leakage on the return line due to cuts or damaged sections in the fire hose. This alternate supply water may be brought into service quickly by closing a branch line valve and opening the fire valve. Closing a branch line valve and opening a small main header branch valve will allow using the alternate return line. If the service water is lost, the Station will initiate Abnormal

PIPING PRESERVATION PROJECT - HYDROLASING PLANNING SHEET

Procedure 15 which will greatly reduce the heat load on the Component Cooling System. Based on conservative calculations, there is about 1 hour and 45 minutes to bring a service water loop on line before the component cooling water temperature becomes critical. Within this time, the service water loop being cleaned will be brought back on line by installing blind flanges. Construction personnel will be on location to perform any emergency installation.

In a LOCA event, the redundant supply line will be brought back on line by utilizing the blind flanges.

The potential flooding from a 24"Ø opened valve into the auxiliary basement will be avoided by danger tagging all valves which are closed for isolation and locking all of these valves which are 18" or larger in accordance with the Stations Administrative Procedures.

This work may be performed in conjunction with other Technical Specification related work, except for cleaning pipe segments 2, 3, 6, 8, 9, 13, 14, 15, 26 and 28.

PIPING PRESERVATION PROJECT - HYDROLASING PLANNING SHEET

PIPE SEGMENT I.D.:	12 Type A
DESIGN CHANGE:	84-83
LOCATION:	Circulating Water Pump Area, Yard and Turbine Building
PIPE LINE NUMBERS:	24"-25, 48 & 425 and 8"-94 & 95
PIPE SEGMENT BOUNDARIES:	Auxiliary SW and CS make-up supply piping from and including valves MOV-217, MOV-117, MOV-119 & MOV-219 up to valves MOV-115A and MOV-215A
REFERENCE DRAWINGS:	11715-FP-5L-7, FP-5M-10 & FP-5N-7
ISOLATION REQUIREMENTS:	24"-25, 425 and 48; 8"-94
PIPING MODIFICATIONS:	Add one 2" line approximately 20' length with valve and flanged ends. Add corrosion monitor probe.
VALVES TO BE REPAIRED:	8"-MOV-119, 8"-MOV-219, 24"-MOV-115B, 24"-MOV-117, 24"-MOV-118, 24"-MOV-215B, 24"-MOV-217
LENGTH OF PIPE TO BE CLEANED:	Approximately 25' of 8"Ø and 725' of 24"Ø Pipe

TECHNICAL SPECIFICATIONS:

Work on this section of pipe will not require the isolation of the main header or any branch of the service water loop. In addition no other Technical Specifications address the auxiliary service water pumps or lines; therefore, work done on this section will not require the initiation of any action statements.

COMPENSATORY MEASURES:

Compensatory measures are not required while performing this work, since it is non-Technical Specification related.

The potential flooding through a 24"Ø valve into the turbine building valve pit will be prevented by danger tagging all valves which are closed for isolation and locking all of these valves which are 18"Ø or greater in accordance with Station Administrative Procedures.

PIPING PRESERVATION PROJECT - HYDROLASING PLANNING SHEET

PIPE SEGMENT I.D.:	13 Type B
DESIGN CHANGE:	84-84
LOCATION:	Turbine Building Basement
PIPE LINE NUMBERS:	24"-425 & 59
PIPE SEGMENT BOUNDARIES:	Between main header and first valve
REFERENCE DRAWINGS:	WS-4B, WS-10A, B & C, WS-9D
ISOLATION REQUIREMENTS:	24"-425 & 59, 36"-2 & 3
PIPING MODIFICATIONS:	None. Access through Valves.
VALVES TO BE REPAIRED:	MOV-220A & MOV-215A
LENGTH OF PIPE TO BE CLEANED:	Approximately 110' of 24"Ø Pipe

TECHNICAL SPECIFICATIONS:

Tech Spec 3.7.4.1 states "at least two service water loops (shared with the other unit) shall be OPERABLE."

The action statement requires the restoration of two loops to OPERABLE status within 72 hours or be in at least hot standby within the next 6 hours and in cold shutdown within the following 30 hours. This action statement applies to both units and would require both units to take the same action should the system not be restored.

Work on this section will require the draining of one main supply header and one main return header. The draining of the headers, the cleaning of the piping, and the restoration to operability will be completed within the 72 hour action statement. Time required to restore the headers into service will be monitored. Cleaning will stop at any point in order to provide adequate time to restore the headers. Once the headers are restored to OPERABLE status a review of the cleaning accomplished will be conducted and a determination will be made if additional header draining will be required in order to complete the cleaning addressed by this section.

PLANS FOR COMPENSATORY ACTION:

Compensatory measures will be taken to maintain service water to the Component Cooling Heat Exchangers and the Charging Pump Coolers in the event that the unisolated supply or return header fails while cleaning the off line loop for this segment. Alternate supply and return water lines will be provided to the Charging Pump Coolers before starting the work. Fire hose will be connected to temporary spool pieces installed in the operating supply and return lines. The supply hose will be connected from the fire protection system and the return hose will connect to a small main header valve. Valves have been added to prevent depressurizing the supply line and minimizing leakage on the return line due to cuts or damaged sections in the fire hose. This alternate supply water may be brought into service quickly by closing a branch line valve and opening the fire valve. Closing a branch line valve and opening a small main header branch valve will allow using the alternate return line. If the service water is lost, the Station will initiate AP (Abnormal Procedure) 15 which will greatly reduce the heat load on the Component Cooling System. Based on conservative calculations, there is about 1 hour and 45 minutes to bring a service

water loop on line before the component cooling water temperature becomes critical. Within this time, the service water loop being cleaned will be brought back on line by installing blind flanges. Construction personnel will be on location to perform any emergency installation.

In a LOCA event, the redundant supply line will be brought back on line by utilizing the blind flanges.

The potential flooding from a 24"Ø opened valve into the auxiliary basement will be avoided by danger tagging all valves which are closed for isolation and locking all of these valves which are 18" or larger in accordance with the Stations Administrative Procedures.

This work may be performed in conjunction with other Technical Specification related work, except for cleaning pipe segments 2, 3, 5, 7, 10, 11, 15, 16, 17, 25 and 27.

PIPING PRESERVATION PROJECT - HYDROLASING PLANNING SHEET

PIPE SEGMENT I.D.:	14 Type C
DESIGN CHANGE:	84-85
LOCATION:	Auxiliary Building Basement
PIPE LINE NUMBERS:	24"-96 & 101
PIPE SEGMENT BOUNDARIES:	From main header to heat exchanger valves.
REFERENCE DRAWINGS:	WS-4B, WS-17A, WS-28A
ISOLATION REQUIREMENTS:	24"-96, 101, C50
PIPING MODIFICATIONS:	Add corrosion monitor probes
VALVES TO BE REPAIRED:	1-SW-247, MOV-208A & B
LENGTH OF PIPE TO BE CLEANED:	8' of 18"Ø and 155' of 24"Ø Pipe

TECHNICAL SPECIFICATIONS:

Tech Spec 3.7.4.1 states "at least two service water loops (shared with the other unit) shall be OPERABLE."

The action statement requires the restoration of two loops to OPERABLE status within 72 hours or be in at least hot standby within the next 6 hours and in cold shutdown within the following 30 hours. This action statement applies to both units and would require both units to take the same action should the system not be restored. Work on this section will require the draining of one branch supply header and one branch return header. The draining of the branch headers, the cleaning of the piping, and the restoration to operability will be completed within the 72 hour action statement. Time required to restore the branch headers into service will be monitored. Cleaning will stop at any point in order to provide adequate time to restore the branch headers. Once the branch headers are restored to OPERABLE status a review of the cleaning accomplished will be conducted and a determination will be made if additional header draining will be required in order to complete the cleaning addressed by this section.

PLANS FOR COMPENSATORY ACTION:

Compensatory measures will be taken to maintain service water to the Component Cooling Heat Exchangers and the Charging Pump Coolers in the event that the unisolated supply or return header fails while cleaning the off line loop for this segment. Alternate supply and return water lines will be provided to the Charging Pump Coolers before starting the work. Fire hose will be connected to temporary spool pieces installed in the operating supply and return lines. The supply hose will be connected from the fire protection system and the return hose will connect to a small main header valve. Valves have been added to the temporary spool pieces to prevent depressurizing the supply line and minimizing leakage on the return line due to cuts or damaged sections in the fire hose. This alternate supply water may be brought into service quickly by closing a branch line valve and opening the fire valve. Closing a branch line valve and opening a small main header branch valve will allow using the alternate return line. If the service water is lost, the Station will initiate AP (Abnormal Procedure) 15 which will greatly reduce the heat load on the Component Cooling System. Based on conservative calculations, there is about 1 hour and 45 minutes to bring a service water loop on line before the component

cooling water temperature becomes critical. Within this time, the service water loop being cleaned will be brought back on line by installing prefabricated spool pieces. Construction personnel will be on location to perform any emergency installation.

In a LOCA event, the redundant supply line will be brought back on line by utilizing the prefabricated spool pieces.

The potential flooding from a 24"Ø opened valve into the auxiliary basement will be avoided by danger tagging all valves which are closed for isolation and locking all of these valves which are 18" or larger in accordance with the Stations Administrative Procedures.

This work may be performed in conjunction with other Technical Specification related work, except for cleaning pipe segments 2, 3, 5, 7, 10, 11, 15, 16, 17, 25 and 27.

PIPING PRESERVATION PROJECT - HYDROLASING PLANNING SHEET

PIPE SEGMENT I.D.:	15 Type C
DESIGN CHANGE:	84-86
LOCATION:	Auxiliary Building Basement
PIPE LINE NUMBERS:	CC Heat Exchangers
PIPE SEGMENT BOUNDARIES:	Between valves supplying heat exchangers.
REFERENCE DRAWINGS:	WS-4B, WS-17A
ISOLATION REQUIREMENTS:	One HX at a time, branch lines
PIPING MODIFICATIONS:	None
VALVES TO BE REPAIRED:	1-SW-233, 221, 194, 232, 185, 186, 230, 187, 222, 223, 240, 176, 195, 241, 184 and 177
LENGTH OF PIPE TO BE CLEANED:	80' of 18"Ø and 40' of 20"Ø Pipe

TECHNICAL SPECIFICATIONS:

Tech Spec 3.7.4.1 states "at least two service water loops (shared between units) shall be OPERABLE."

The action statement requires the restoration of two loops to OPERABLE status within 72 hours or be in at least hot standby within the next 6 hours and in cold shutdown within the following 30 hours. This action statement applies to both units and would require both units to take the same action should the system not be restored. The four CC heat exchangers will be cleaned one at a time, leaving three in service (two are required for two units to operate). Each heat exchanger will require the isolation of both branch lines in sequence to allow the placement of flanges over the ends of the branch lines where the butterfly valves are to be removed. Once cleaning is complete the branch lines will be isolated to allow the reinstallation of the valves. At no time will both trains be isolated from service. As many as 16 branch line isolations will be required for this section. Each branch line isolation for this section is expected to last from three to five hours.

Tech Spec 3.7.3.1 states "at least two component cooling water subsystems (shared with the other unit) shall be OPERABLE."

The cleaning of this section will not reduce the number of CC heat exchangers below two. Therefore, the action statement for this Tech Spec will not be entered.

PLANS FOR COMPENSATORY ACTION:

Compensatory measures will be taken to maintain service water to the Component Cooling Heat Exchangers in the event that the unisolated supply or return branch header fails while cleaning the off line loop for this segment. If the service water is lost, the Station will initiate AP (Abnormal Procedure) 15 which will greatly reduce the heat load on the Component Cooling System. Based on conservative calculations, there is about 1 hour and 45 minutes to bring a service water loop on line before the component cooling water temperature becomes critical. Within this time, the service water loop being cleaned will be brought back on line by installing blind flanges which will isolate only one Heat Exchanger from service. Construction personnel will be on location to perform any emergency installation.

PIPING PRESERVATION PROJECT - HYDROLASING PLANNING SHEET

In a LOCA event, the redundant supply line will be brought back on line by utilizing the blind flanges.

The potential flooding from a 24"Ø opened valve into the auxiliary basement will be avoided by danger tagging all valves which are closed for isolation and locking all of these valves which are 18" or larger in accordance with the Stations Administrative Procedures.

This work may not be performed in conjunction with any other Technical Specification related work.

PIPING PRESERVATION PROJECT - HYDROLASING PLANNING SHEET

PIPE SEGMENT I.D.:	16 Type C
DESIGN CHANGE:	84-87
LOCATION:	Auxiliary Building Basement
PIPE LINE NUMBERS:	24"-95 & 102
PIPE SEGMENT BOUNDARIES:	From main header to heat exchanger valves.
REFERENCE DRAWINGS:	WS-19A, WS-28C
ISOLATION REQUIREMENTS:	24"-95, 102, and 4"-C51
PIPING MODIFICATIONS:	None
VALVES TO BE REPAIRED:	MOV-108A, 108B and 1-SW-250
LENGTH OF PIPE TO BE CLEANED:	32' of 18"Ø and 185' of 24"Ø Pipe

TECHNICAL SPECIFICATIONS:

Tech Spec 3.7.4.1 states "at least two service water loops (shared with the other unit) shall be OPERABLE."

The action statement requires the restoration of two loops to OPERABLE status within 72 hours or be in at least hot standby within the next 6 hours and in cold shutdown within the following 30 hours. This action statement applies to both units and would require both units to take the same action should the system not be restored. Work on this section will require the draining of one branch supply header and one branch return header. The draining of the branch headers, the cleaning of the piping, and the restoration to operability will be completed within the 72 hour action statement. Time required to restore the branch headers into service will be monitored. Cleaning will stop at any point in order to provide adequate time to restore the branch headers. Once the branch headers are restored to OPERABLE status a review of the cleaning accomplished will be conducted and a determination will be made if additional header draining will be required in order to complete the cleaning addressed by this section.

PLANS FOR COMPENSATORY ACTION:

Compensatory measures will be taken to maintain service water to the Component Cooling Heat Exchangers and the Charging Pump Coolers in the event that the unisolated supply or return header fails while cleaning the off line loop for this segment. Alternate supply and return water lines will be provided to the Charging Pump Coolers before starting the work. Fire hose will be connected to temporary spool pieces installed in the operating supply and return lines. The supply hose will be connected from the fire protection system and the return hose will connect to a small main header valve. Valves have been added to the temporary spool pieces to prevent depressurizing the supply line and minimizing leakage on the return line due to cuts or damaged sections in the fire hose. This alternate supply water may be brought into service quickly by closing a branch line valve and opening the fire valve. Closing a branch line valve and opening a small main header branch valve will allow using the alternate return line. If the service water is lost, the Station will initiate AP (Abnormal Procedure) 15 which will greatly reduce the heat load on the Component Cooling System. Based on conservative calculations, there is about 1 hour and 45 minutes to bring a service water loop on line before the component

cooling water temperature becomes critical. Within this time, the service water loop being cleaned will be brought back on line by installing prefabricated spool pieces. Construction personnel will be on location to perform any emergency installation.

In a LOCA event, the redundant supply line will be brought back on line by utilizing the prefabricated spool pieces.

The potential flooding from a 24"Ø opened valve into the auxiliary basement will be avoided by danger tagging all valves which are closed for isolation and locking all of these valves which are 18" or larger in accordance with the Stations Administrative Procedures.

This work may be performed in conjunction with other Technical Specification related work, except for cleaning pipe segments 2, 3, 6, 8, 9, 13, 14, 15, 18, 26 and 28.

PIPING PRESERVATION PROJECT - HYDROLASING PLANNING SHEET

PIPE SEGMENT I.D.:	17 Type B
DESIGN CHANGE:	84-88
LOCATION:	Safeguards
PIPE LINE NUMBERS:	24"-428 & 434
PIPE SEGMENT BOUNDARIES:	Main header to valves MOV-201A & B, MOV-205A & B; TV-102A & B; 2SW-21 & 15
REFERENCE DRAWINGS:	WS-2A, WS-201B
ISOLATION REQUIREMENTS:	Lines 36"-1 & 3; 24"-428 & 434
PIPING MODIFICATIONS:	Add 2" recirc. line. Add corrosion monitor probe.
VALVES TO BE REPAIRED:	2-MOV-201A, 210A, 201B, 205A, 214A and 205B
LENGTH OF PIPE TO BE CLEANED:	20' of 3"Ø, 30' of 8"Ø and 90' of 24"Ø Pipe

TECHNICAL SPECIFICATIONS:

Tech Spec 3.7.4.1 states "at least two service water loops (shared with the other unit) shall be OPERABLE."

The action statement requires the restoration of two loops to OPERABLE status within 72 hours or be in at least hot standby within the next 6 hours and in cold shutdown within the following 30 hours. This action statement applies to both units and would require both units to take the same action should the system not be restored.

Work on this section will require the draining of one main supply header and one main return header. The draining of the headers, the cleaning of the piping, and the restoration to operability will be completed within the 72 hour action statement. Time required to restore the headers into service will be monitored. Cleaning will stop at any point in order to provide adequate time to restore the headers. Once the headers are restored to OPERABLE status a review of the cleaning accomplished will be conducted and a determination will be made if additional header draining will be required in order to complete the cleaning addressed by this section.

PLANS FOR COMPENSATORY ACTION:

Compensatory measures will be taken to maintain service water to the Component Cooling Heat Exchangers and the Charging Pump Coolers in the event that the unisolated supply or return header fails while cleaning the off line loop for this segment. Alternate supply and return water lines will be provided to the Charging Pump Coolers before starting the work. Fire hose will be connected to temporary spool pieces installed in the operating supply and return lines. The supply hose will be connected from the fire protection system and the return hose will connect to a small main header valve. Valves have been added to the temporary spool pieces to prevent depressurizing the supply line and minimizing leakage on the return line due to cuts or damaged sections in the fire hose. This alternate supply water may be brought into service quickly by closing a branch line valve and opening the fire valve. Closing a branch line valve and opening a small main header branch valve will allow using the alternate return line. If the service water is lost, the Station will initiate AP (Abnormal

Procedure) 15 which will greatly reduce the heat load on the Component Cooling System. Based on conservative calculations, there is about 1 hour and 45 minutes to bring a service water loop on line before the component cooling water temperature becomes critical. Within this time, the service water loop being cleaned will be brought back on line by installing prefabricated spool pieces. Construction personnel will be on location to perform any emergency installation. The Recirculating Spray System is a safety system required 5 minutes after a LOCA event but not during normal operation. Therefore, no compensatory measures are necessary to account for the failure of the on-line loop while the redundant loop is cleaned. If the on-line loop does fail, the installation of the prefabricated spool piece for supply water to the Component Cooling System will re-establish supply to the Recirculating Spray Heat Exchangers.

The possibility of a LOCA event occurring at the same time that the on-line main header fails is considered extremely unlikely.

The potential flooding from a 24"Ø opened valve into the quench spray building basement will be avoided by danger tagging all valves which are closed for isolation and locking all of these valves which are 18" or larger in accordance with the Stations Administrative Procedures.

This work may be performed in conjunction with other Technical Specification related work, except for cleaning pipe segments 2, 3, 6, 8, 9, 13, 14, 15, 25 and 27.

PIPING PRESERVATION PROJECT - HYDROLASING PLANNING SHEET

PIPE SEGMENT I.D.:	18 Type B
DESIGN CHANGE:	84-89
LOCATION:	Safeguards
PIPE LINE NUMBERS:	24"-426 & 436
PIPE SEGMENT BOUNDARIES:	Main header to first valves, plus all of lines 515 & 513 to "T'S".
REFERENCE DRAWINGS:	WS-4A, WS-201B
ISOLATION REQUIREMENTS:	Lines 36"-2 & 4; 24'-426 & 436
PIPING MODIFICATIONS:	Add 2" recirc. line
VALVES TO BE REPAIRED:	2-MOV-201C, 210B, 205C, 214B, 201D & 205D
LENGTH OF PIPE TO BE CLEANED:	20' of 3"Ø, 30' of 8"Ø and 110' of 24"Ø Pipe

TECHNICAL SPECIFICATIONS:

Tech Spec 3.7.4.1 states "at least two service water loops (shared with the other unit) shall be OPERABLE."

The action statement requires the restoration of two loops to OPERABLE status within 72 hours or be in at least hot standby within the next 6 hours and in cold shutdown within the following 30 hours. This action statement applies to both units and would require both units to take the same action should the system not be restored.

Work on this section will require the draining of one main supply header and one main return header. The draining of the headers, the cleaning of the piping, and the restoration to operability will be completed within the 72 hour action statement. Time required to restore the headers into service will be monitored. Cleaning will stop at any point in order to provide adequate time to restore the headers. Once the headers are restored to OPERABLE status a review of the cleaning accomplished will be conducted and a determination will be made if additional header draining will be required in order to complete the cleaning addressed by this section.

PLANS FOR COMPENSATORY ACTION:

Compensatory measures will be taken to maintain service water to the Component Cooling Heat Exchangers and the Charging Pump Coolers in the event that the unisolated supply or return header fails while cleaning the off line loop for this segment. Alternate supply and return water lines will be provided to the Charging Pump Coolers before starting the work. Fire hose will be connected to temporary spool pieces installed in the operating supply and return lines. The supply hose will be connected from the fire protection system and the return hose will connect to a small main header valve. Valves have been added to the temporary spool pieces to prevent depressurizing the supply line and minimizing leakage on the return line due to cuts or damaged sections in the fire hose. This alternate supply water may be brought into service quickly by closing a branch line valve and opening the fire valve. Closing a branch line valve and opening a small main header branch valve will allow using the alternate return line. If the service water is lost, the Station will initiate AP (Abnormal Procedure) 15 which will greatly reduce the heat load on the Component

Cooling System. Based on conservative calculations, there is about 1 hour and 45 minutes to bring a service water loop on line before the component cooling water temperature becomes critical. Within this time, the service water loop being cleaned will be brought back on line by installing prefabricated spool pieces. Construction personnel will be on location to perform any emergency installation. The Recirculating Spray System is a safety system required 5 minutes after a LOCA event but not during normal operation. Therefore, no compensatory measures are necessary to account for the failure of the on-line loop while the redundant loop is cleaned. If the on-line loop does fail, the installation of the prefabricated spool piece for supply water to the Component Cooling System will re-establish supply to the Recirculating Spray Heat Exchangers.

The possibility of a LOCA event occurring at the same time that the on-line main header fails is considered extremely unlikely.

The potential flooding from a 24"Ø opened valve into the quench spray building basement will be avoided by danger tagging all valves which are closed for isolation and locking all of these valves which are 18" or larger in accordance with the Stations Administrative Procedures.

This work may be performed in conjunction with other Technical Specification related work, except for cleaning pipe segments 2, 3, 5, 7, 9, 15, 16, 17, 25 and 27.

PIPING PRESERVATION PROJECT - HYDROLASING PLANNING SHEET

PIPE SEGMENT I.D.: 19
DESIGN CHANGE: 84-90

NOTE: THIS SECTION HAS BEEN COMBINED WITH OTHER SECTIONS.

PIPING PRESERVATION PROJECT - HYDROLASING PLANNING SHEET

PIPE SEGMENT I.D.:	20 Type D
DESIGN CHANGE:	84-91
LOCATION:	Safeguards
PIPE LINE NUMBERS:	24"-428
PIPE SEGMENT BOUNDARIES:	From MOV-201B to MOV-202B; MOV203C & MOV-203D
REFERENCE DRAWINGS:	WS-21A
ISOLATION REQUIREMENTS:	Line 24"-428 during maintenance outage.
PIPING MODIFICATIONS:	None. Remove expansion joint for pipe access.
VALVES TO BE REPAIRED:	2-MOV-202A
LENGTH OF PIPE TO BE CLEANED:	8' of 6"Ø, 35' of 16"Ø and 60' of 24"Ø Pipe

TECHNICAL SPECIFICATIONS:

Tech Spec 3.6.2.2 requires four separate and independent containment recirculation spray subsystems. With one subsystem inoperable, restore within seven days.

Due to the arrangement of this section of piping, the section cannot be isolated without removing two heat exchangers from OPERABLE status. Therefore, this section pipe will be cleaned during a maintenance outage.

PLANS FOR COMPENSATORY ACTION:

There are no plans for compensatory action since the unit will be in cold shut down for maintenance.

The potential flooding from a 16"Ø motor operator valve into the quench spray building basement will be avoided by tagging out the isolation valves in accordance with Station Administrative Procedures.

Cleaning this segment is not effected by work on other segments since, the cleaning takes place during a refueling outage.

PIPING PRESERVATION PROJECT - HYDROLASING PLANNING SHEET

PIPE SEGMENT I.D.:	21 Type D
DESIGN CHANGE:	84-92
LOCATION:	Safeguards
PIPE LINE NUMBERS:	24"-426
PIPE SEGMENT BOUNDARIES:	Between valves MOV-201D; 202B; 203A; 203D & 2-SW-69
REFERENCE DRAWINGS:	WS-4A
ISOLATION REQUIREMENTS:	Line 24"-426 & Recirc Spray Heat Exchangers (2-RS-E-1A & 1D). During outage.
PIPING MODIFICATIONS:	None. Remove expansion joint for pipe access.
VALVES TO BE REPAIRED:	None
LENGTH OF PIPE TO BE CLEANED:	8' of 6"Ø, 70' of 16"Ø and 35' of 24"Ø Pipe

TECHNICAL SPECIFICATIONS:

Tech Spec 3.6.2.2 requires four separate and independent containment recirculation spray subsystems. With one subsystem inoperable, restore within seven days.

Due to the arrangement of this section of piping, the section cannot be isolated without removing two heat exchangers from OPERABLE status. Therefore, this section pipe will be cleaned during a maintenance outage.

PLANS FOR COMPENSATORY ACTION:

There are no plans for compensatory action since the unit will be in cold shut down for maintenance.

The potential flooding from a 16"Ø motor operator valve into the quench spray building basement will be avoided by tagging out the isolation valves in accordance with Station Administrative Procedures.

Cleaning this segment is not effected by work on other segments since, the cleaning takes place during a refueling outage.

PIPING PRESERVATION PROJECT - HYDROLASING PLANNING SHEET

PIPE SEGMENT I.D.:	22 Type D
DESIGN CHANGE:	84-93
LOCATION:	Safeguards
PIPE LINE NUMBERS:	24"-434
PIPE SEGMENT BOUNDARIES:	Between valves MOV-205B, 206B, 204A, 204D
REFERENCE DRAWINGS:	WS-201B
ISOLATION REQUIREMENTS:	Line 24"-434 and 2-RS-E-1A & 1D during outage.
PIPING MODIFICATIONS:	None
VALVES TO BE REPAIRED:	2-MOV-206A
LENGTH OF PIPE TO BE CLEANED:	80' of 16"Ø and 30' of 24"Ø Pipe

TECHNICAL SPECIFICATIONS:

Tech Spec 3.6.2.2 requires four separate and independent containment recirculation spray subsystems. With one subsystem inoperable, restore within seven days.

Due to the arrangement of this section of piping, the section cannot be isolated without removing two heat exchangers from OPERABLE status. Therefore, this section pipe will be cleaned during a maintenance outage.

PLANS FOR COMPENSATORY ACTION:

There are no plans for compensatory action since the unit will be in cold shut down for maintenance.

The potential flooding from a 16"Ø motor operated valve into the quench spray building basement will be avoided by tagging out the isolation valves in accordance with Station Administrative Procedures.

Cleaning this segment is not effected by work on other segments since, the cleaning takes place during a refueling outage.

PIPING PRESERVATION PROJECT - HYDROLASING PLANNING SHEET

PIPE SEGMENT I.D.:	23 Type D
DESIGN CHANGE:	84-94
LOCATION:	Safeguards
PIPE LINE NUMBERS:	24"-436, 16"-440, 16"-439
PIPE SEGMENT BOUNDARIES:	Between valves MOV-205C, 206B, 204B & 204C
REFERENCE DRAWINGS:	WS-201B, WS-207C
ISOLATION REQUIREMENTS:	24"-436, 2-RS-E-1B & 1C
PIPING MODIFICATIONS:	None
VALVES TO BE REPAIRED:	2-MOV-206B
LENGTH OF PIPE TO BE CLEANED:	50' of 16"Ø and 40' of 24"Ø Pipe

TECHNICAL SPECIFICATIONS:

Tech Spec 3.6.2.2 requires four separate and independent containment recirculation spray subsystems. With one subsystem inoperable, restore within seven days.

Due to the arrangement of this section of piping, the section cannot be isolated without removing two heat exchangers from OPERABLE status. Therefore, this section pipe will be cleaned during a maintenance outage.

PLANS FOR COMPENSATORY ACTION:

There are no plans for compensatory action since the unit will be in cold shut down for maintenance.

The potential flooding from a 16"Ø motor operated valve into the quench spray building basement will be avoided by tagging out the isolation valves in accordance with Station Administrative Procedures.

Cleaning this segment is not effected by work on other segments since, the cleaning takes place during a refueling outage.

PIPING PRESERVATION PROJECT - HYDROLASING PLANNING SHEET

PIPE SEGMENT I.D.:	24 Type E
DESIGN CHANGE:	84-95
LOCATION:	Safeguards & Containment
PIPE LINE NUMBERS:	Recirc Spray Heat Exchangers - Unit 2
PIPE SEGMENT BOUNDARIES:	Between valves MOV-204A & 203A; 204B & 203B; MOV-204C & 203D; 204D & 203D
REFERENCE DRAWINGS:	WS-206D
ISOLATION REQUIREMENTS:	All branch lines to heat exchangers, requires refueling outage.
PIPING MODIFICATIONS:	None
VALVES TO BE REPAIRED:	2-MOV-204A, 204B, 203A, 203B, 203C, 203D, 204C and 204D
LENGTH OF PIPE TO BE CLEANED:	450' of 16"Ø Pipe

TECHNICAL SPECIFICATIONS:

Work on this section of pipe will require dismantling of valves needed for containment isolation. (Tech Spec 3.6.1.1 "Containment Integrity") Therefore, this section of pipe will be cleaned during a refueling outage.

PLANS FOR COMPENSATORY ACTION:

There are no plans for compensatory action since the unit will be in cold shut down for refueling.

The potential flooding from a 16"Ø motor operated valve into the containment sumps will be avoided by tagging out the isolation valves in accordance with Station Administrative Procedures.

Cleaning this segment is not effected by work on other segments, since the cleaning takes place during a refueling outage.

PIPING PRESERVATION PROJECT - HYDROLASING PLANNING SHEET

PIPE SEGMENT I.D.:	25 Type B
DESIGN CHANGE:	84-96
LOCATION:	Auxiliary Building 244'/Safeguards
PIPE LINE NUMBERS:	24"-28
PIPE SEGMENT BOUNDARIES:	36" to 24" reducer through 24"-28 to branch valves: TV-101A; MOV-101B; MOV-101A (all of line 24"-29) & 1-SW-37
REFERENCE DRAWINGS:	WS-2B
ISOLATION REQUIREMENTS:	36"-1, 24"-28, 8"-113 & 3"-42
PIPING MODIFICATIONS:	Access through man-way & MOV-101B. Clean from both ends. Two Hydrolasers. Add 2" recirc line.
VALVES TO BE REPAIRED:	1-MOV-110B, 101A & 101B
LENGTH OF PIPE TO BE CLEANED:	10' of 3"Ø, 20' of 8"Ø and 170' of 24"Ø Pipe

TECHNICAL SPECIFICATIONS:

Tech Spec 3.7.4.1 states "at least two service water loops (shared between units) shall be OPERABLE."

The action statement requires the restoration of two loops to OPERABLE status within 72 hours or be in at least hot standby within the next 6 hours and in cold shutdown within the following 30 hours.

This action statement applies to both units and would require both units to take the same action should the system not be restored. Work on this section will require the draining of one main supply header, the draining of the header, the cleaning of the piping, and the restoration to OPERABLE status will be completed within the 72 hour action statement. Time required to restore the header into service will be determined. Cleaning will stop at any point in order to provide adequate time to restore the header. Once the header is restored to OPERABLE status a review of the cleaning accomplished will be conducted and a determination will be made if additional header draining will be required in order to complete the cleaning addressed by this section.

PLANS FOR COMPENSATORY ACTION:

Compensatory measures will be taken to maintain service water to the Component Cooling Heat Exchangers and the Charging Pump Coolers in the event that the unisolated supply or return header fails while cleaning the off line loop for this segment. Alternate supply and return water lines will be provided to the Charging Pump Coolers before starting the work. The supply and return lines will have temporary spool piece installed with a hose connected from the supply temporary spool piece to the fire protection supply, and from the return temporary spool piece to a main header return line. Valves have been added to prevent depressurizing the supply line and minimizing leakage on the return line due to cuts or damaged sections in the fire hose. This alternate supply water may be brought into service quickly by closing a branch line valve and opening the fire valve. Closing a branch line valve and opening a small main header branch valve will allow using the alternate return line. If the service

water is lost, the Station will initiate AP (Abnormal Procedure) 15 which will greatly reduce the heat load on the Component Cooling System. Based on conservative calculations, there is about 1 hour and 45 minutes to bring a service water loop on line before the component cooling water temperature becomes critical. Within this time, the service water loop being cleaned will be brought back on line by installing prefabricated spool pieces. Construction personnel will be on location to perform any emergency installation. The Recirculating Spray System is a safety system required 5 minutes after a LOCA event but not during normal operation. Therefore, no compensatory measures are necessary to account for the failure of the on-line loop while the redundant loop is cleaned. If the on-line loop does fail, the installation of the prefabricated spool piece for supply water to the Component Cooling System will re-establish supply to the Recirculating Spray Heat Exchangers.

The possibility of a LOCA event occurring at the same time that the on-line main header fails is considered extremely unlikely.

The potential flooding from a 24"Ø opened valve into the auxiliary basement will be avoided by danger tagging all valves which are closed for isolation and locking all of these valves which are 18" or larger in accordance with the Stations Administrative Procedures.

This work may be performed in conjunction with other Technical Specification related work, except for cleaning pipe segments 2, 3, 6, 8, 9, 13, 14, 15, 17 and 18.

PIPING PRESERVATION PROJECT - HYDROLASING PLANNING SHEET

.1PIPE SEGMENT I.D.:	26 Type B
DESIGN CHANGE:	84-97
LOCATION:	Auxiliary Building to Safeguards
PIPE LINE NUMBERS:	24"-26
PIPE SEGMENT BOUNDARIES:	From 36" to 24" reducer to branch line valves
REFERENCE DRAWINGS:	WS-4B
ISOLATION REQUIREMENTS:	36"-2, 8"-113, 3"-43, & 24"-26
PIPING MODIFICATIONS:	See DC 84-93. Add 2" recirc line. Add corrosion monitor probes.
VALVES TO BE REPAIRED:	1-MOV-101C, 101D and 110A
LENGTH OF PIPE TO BE CLEANED:	10' of 3"Ø, 10' of 8"Ø and 185' of 24"Ø Pipe

TECHNICAL SPECIFICATIONS:

Tech Spec 3.7.4.1 states "at least two service water loops (shared between units) shall be OPERABLE."

The action statement requires the restoration of two loops to OPERABLE status within 72 hours or be in at least hot standby within the next 6 hours and in cold shutdown within the following 30 hours.

This action statement applies to both units and would require both units to take the same action should the system not be restored. Work on this section will require the draining of one main supply header, the draining of the header, the cleaning of the piping, and the restoration to OPERABLE status will be completed within the 72 hour action statement. Time required to restore the header into service will be determined. Cleaning will stop at any point in order to provide adequate time to restore the header. Once the header is restored to OPERABLE status a review of the cleaning accomplished will be conducted and a determination will be made if additional header draining will be required in order to complete the cleaning addressed by this section.

PLANS FOR COMPENSATORY ACTION:

Compensatory measures will be taken to maintain service water to the Component Cooling Heat Exchangers and the Charging Pump Coolers in the event that the unisolated supply or return header fails while cleaning the off line loop for this segment. Alternate supply and return water lines will be provided to the Charging Pump Coolers before starting the work. The supply and return lines will have a temporary spool piece installed with a hose connected from the supply temporary spool piece to the fire protection supply, and from the return temporary spool piece to a main header return line. Valves have been added to prevent depressurizing the supply line and minimizing leakage on the return line due to cuts or damaged sections in the fire hose. This alternate supply water may be brought into service quickly by closing a branch line valve and opening the fire valve. Closing a branch line valve and opening a small main header branch valve will allow using the alternate return line. If the service water is lost, the Station will initiate AP (Abnormal Procedure) 15 which will greatly reduce the heat load on the Component Cooling System. Based

on conservative calculations, there is about 1 hour and 45 minutes to bring a service water loop on line before the component cooling water temperature becomes critical. Within this time, the service water loop being cleaned will be brought back on line by installing prefabricated spool pieces. Construction personnel will be on location to perform any emergency installation. The Recirculating Spray System is a safety system required 5 minutes after a LOCA event but not during normal operation. Therefore, no compensatory measures are necessary to account for the failure of the on-line loop while the redundant loop is cleaned. If the on-line loop does fail, the installation of the prefabricated spool piece for supply water to the Component Cooling System will re-establish supply to the Recirculating Spray Heat Exchangers.

The possibility of a LOCA event occurring at the same time that the on-line main header fails is considered extremely unlikely.

The potential flooding from a 24"Ø opened valve into the auxiliary basement will be avoided by danger tagging all valves which are closed for isolation and locking all of these valves which are 18" or larger in accordance with the Stations Administrative Procedures.

This work may be performed in conjunction with other Technical Specification related work, except for cleaning pipe segments 2, 3, 5, 7, 10, 11, 15, 16, 15 and 27.

PIPING PRESERVATION PROJECT - HYDROLASING PLANNING SHEET

PIPE SEGMENT I.D.:	27 Type B
DESIGN CHANGE:	84-98
LOCATION:	Auxiliary Building/Safeguards
PIPE LINE NUMBERS:	24"-34
PIPE SEGMENT BOUNDARIES:	From 36" to 24" reducer to valves on branch lines. Same pattern and segments as DC 84-96 & 97.
REFERENCE DRAWINGS:	WS-6B
ISOLATION REQUIREMENTS:	36"-3, 24"-34, 8"-116, & 3"-44
PIPING MODIFICATIONS:	Add corrosion monitor probe.
VALVES TO BE REPAIRED:	1-MOV-105A, 105B and 114A
LENGTH OF PIPE TO BE CLEANED:	10' of 3"Ø, 10' of 8"Ø and 200' of 24"Ø Pipe

TECHNICAL SPECIFICATIONS:

Tech Spec 3.7.4.1 states "at least two service water loops (shared with the other unit) shall be OPERABLE."

The action statement requires the restoration of two loops to OPERABLE status within 72 hours or be in at least hot standby within the next 6 hours and in cold shutdown within the following 30 hours.

This action statement applies to both units and would require both unit to take the same action should the system not be restored. Work on this section will require the draining of one main return header, the draining of the header, the cleaning of the piping, and the restoration to OPERABLE status will be completed within the 72 hour action statement. Time required to restore the header into service will be determined. Cleaning will stop at any point in order to provide adequate time to restore the header. Once the header is restored to OPERABLE status, a review of the cleaning accomplished will be conducted and a determination will be made if additional header draining will be required in order to complete the cleaning addressed by this section.

PLANS FOR COMPENSATORY ACTION:

Compensatory measures will be taken to maintain service water to the Component Cooling Heat Exchangers and the Charging Pump Coolers in the event that the unisolated supply or return header fails while cleaning the off line loop for this segment. Alternate supply and return water lines will be provided to the Charging Pump Coolers before starting the work. The supply and return lines will have a temporary spool piece installed with a hose connected from the supply temporary spool piece to the fire protection supply, and from the return temporary spool piece to a main header return line. Valves have been added to prevent depressurizing the supply line and minimizing leakage on the return line due to cuts or damaged sections in the fire hose. This alternate supply water may be brought into service quickly by closing a branch line valve and opening the fire valve. Closing a branch line valve and opening a small main header branch valve will allow using the alternate return line. If the service water is lost, the Station will initiate AP (Abnormal Procedure) 15 which will greatly reduce the heat load on the Component Cooling System. Based

on conservative calculations, there is about 1 hour and 45 minutes to bring a service water loop on line before the component cooling water temperature becomes critical. Within this time, the service water loop being cleaned will be brought back on line by installing prefabricated spool pieces. Construction personnel will be on location to perform any emergency installation. The Recirculating Spray System is a safety system required 5 minutes after a LOCA event but not during normal operation. Therefore, no compensatory measures are necessary to account for the failure of the on-line loop while the redundant loop is cleaned. If the on-line loop does fail, the installation of the prefabricated spool piece for supply water to the Component Cooling System will re-establish supply to the Recirculating Spray Heat Exchangers.

The possibility of a LOCA event occurring at the same time that the on-line main header fails is considered extremely unlikely.

The potential flooding from a 24"Ø opened valve into the auxiliary basement will be avoided by danger tagging all valves which are closed for isolation and locking all of these valves which are 18" or larger in accordance with the Stations Administrative Procedures.

This work may be performed in conjunction with other Technical Specification related work, except for cleaning pipe segments 2, 3, 6, 8, 9, 13, 14, 15, 17, 18, 26 and 28.

PIPING PRESERVATION PROJECT - HYDROLASING PLANNING SHEET

PIPE SEGMENT I.D.:	28 Type B
DESIGN CHANGE:	84-99
LOCATION:	Auxiliary Building/Safeguards
PIPE LINE NUMBERS:	24"-36
PIPE SEGMENT BOUNDARIES:	36" to 24" reducer to branch line valves
REFERENCE DRAWINGS:	WS-88
ISOLATION REQUIREMENTS:	36"-4, 24"-36, 8"-115 & 3"-45
PIPING MODIFICATIONS:	None, See DC 84-96
VALVES TO BE REPAIRED:	1-MOV-105C, 105D and 114B
LENGTH OF PIPE TO BE CLEANED:	10' of 3"Ø, 20' of 8"Ø and 220' of 24"Ø Pipe

TECHNICAL SPECIFICATIONS:

Tech Spec 3.7.4.1 states "at least two service water loops (shared with the other unit) shall be OPERABLE."

The action statement requires the restoration of two loops to OPERABLE status within 72 hours or be in at least hot standby within the next 6 hours and in cold shutdown within the following 30 hours.

This action statement applies to both units and would require both unit to take the same action should the system not be restored. Work on this section will require the draining of one main return header, the draining of the header, the cleaning of the piping, and the restoration to OPERABLE status will be completed within the 72 hour action statement. Time required to restore the header into service will be determined. Cleaning will stop at any point in order to provide adequate time to restore the header. Once the header is restored to OPERABLE status, a review of the cleaning accomplished will be conducted and a determination will be made if additional header draining will be required in order to complete the cleaning addressed by this section.

PLANS FOR COMPENSATORY ACTION:

Compensatory measures will be taken to maintain service water to the Component Cooling Heat Exchangers and the Charging Pump Coolers in the event that the unisolated supply or return header fails while cleaning the off line loop for this segment. Alternate supply and return water lines will be provided to the Charging Pump Coolers before starting the work. The supply and return lines will have a temporary spool piece installed with a hose connected from the supply temporary spool piece to the fire protection supply, and from the return temporary spool piece to a main header return line. Valves have been added to prevent depressurizing the supply line and minimizing leakage on the return line due to cuts or damaged sections in the fire hose. This alternate supply water may be brought into service quickly by closing a branch line valve and opening the fire valve. Closing a branch line valve and opening a small main header branch valve will allow using the alternate return line. If the service water is lost, the Station will initiate AP (Abnormal Procedure) 15 which will greatly reduce the heat load on the Component Cooling System. Based on conservative calculations, there is about 1 hour and 45 minutes to bring a service water loop on line before the component cooling water temperature

becomes critical. Within this time, the service water loop being cleaned will be brought back on line by installing prefabricated spool pieces. Construction personnel will be on location to perform any emergency installation. The Recirculating Spray System is a safety system required 5 minutes after a LOCA event but not during normal operation. Therefore, no compensatory measures are necessary to account for the failure of the on-line loop while the redundant loop is cleaned. If the on-line loop does fail, the installation of the prefabricated spool piece for supply water to the Component Cooling System will re-establish supply to the Recirculating Spray Heat Exchangers.

The possibility of a LOCA event occurring at the same time that the on-line main header fails is considered extremely unlikely.

The potential flooding from a 24"Ø opened valve into the auxiliary basement will be avoided by danger tagging all valves which are closed for isolation and locking all of these valves which are 18" or larger in accordance with the Stations Administrative Procedures.

This work may be performed in conjunction with other Technical Specification related work, except for cleaning pipe segments 2, 3, 5, 7, 10, 11, 15, 16, 25 and 27.

PIPING PRESERVATION PROJECT - HYDROLASING PLANNING SHEET

PIPE SEGMENT I.D.:	29 Type D
DESIGN CHANGE:	84-100
LOCATION:	Safeguards
PIPE LINE NUMBERS:	16"-30
PIPE SEGMENT BOUNDARIES:	Between MOV's 101B, 103A, 102B & 103A
REFERENCE DRAWINGS:	WS-12A
ISOLATION REQUIREMENTS:	Line 16"-30
PIPING MODIFICATIONS:	None
VALVES TO BE REPAIRED:	1-MOV-102A
LENGTH OF PIPE TO BE CLEANED:	80' of 16"Ø and 30' of 24"Ø Pipe

TECHNICAL SPECIFICATIONS:

Tech Spec 3.6.2.2 requires four separate and independent containment recirculation spray subsystems. With one subsystem inoperable, restore within seven days.

Due to the arrangement of this section of piping, the section cannot be isolated without removing two heat exchangers from OPERABLE status. Therefore, this section pipe will be cleaned during a maintenance outage.

PLANS FOR COMPENSATORY ACTION:

There are no plans for compensatory action since the unit will be in cold shut down for refueling.

The potential flooding from a 16"Ø motor operated valve into the quench spray building basement will be avoided by tagging out the isolation valves in accordance with Station Administrative Procedures.

Cleaning this segment is not effected by work on other segments since, the cleaning takes place during a maintenance outage.

PIPING PRESERVATION PROJECT - HYDROLASING PLANNING SHEET

PIPE SEGMENT I.D.:	30 Type D
DESIGN CHANGE:	84-101
LOCATION:	Safeguards
PIPE LINE NUMBERS:	16"-41
PIPE SEGMENT BOUNDARIES:	Between MOV's 105C, 106A, 104A & 104D
REFERENCE DRAWINGS:	WS-15B
ISOLATION REQUIREMENTS:	16"-41
PIPING MODIFICATIONS:	None
VALVES TO BE REPAIRED:	1-MOV-106B
LENGTH OF PIPE TO BE CLEANED:	8' of 6"Ø, 35' of 16"Ø and 60' of 24"Ø Pipe

TECHNICAL SPECIFICATIONS:

Tech Spec 3.6.2.2 requires four separate and independent containment recirculation spray subsystems. With one subsystem inoperable, restore within seven days.

Due to the arrangement of this section of piping, the section cannot be isolated without removing two heat exchangers from OPERABLE status. Therefore, this section pipe will be cleaned during a maintenance outage.

PLANS FOR COMPENSATORY ACTION:

There are no plans for compensatory action since the unit will be in cold shut down for refueling.

The potential flooding from a 16"Ø motor operated valve into the quench spray building basement will be avoided by tagging out the isolation valves in accordance with Station Administrative Procedures.

Cleaning this segment is not effected by work on other segments since, the cleaning takes place during a maintenance outage.

PIPING PRESERVATION PROJECT - HYDROLASING PLANNING SHEET

PIPE SEGMENT I.D.:	31 Type D
DESIGN CHANGE:	84-102
LOCATION:	Safeguards
PIPE LINE NUMBERS:	16"-31
PIPE SEGMENT BOUNDARIES:	Between MOV's
REFERENCE DRAWINGS:	WS-13A
ISOLATION REQUIREMENTS:	16"-31
PIPING MODIFICATIONS:	None
VALVES TO BE REPAIRED:	1-MOV-102B
LENGTH OF PIPE TO BE CLEANED:	8' of 6"Ø, 70' of 16"Ø and 35' of 24"Ø Pipe

TECHNICAL SPECIFICATIONS:

Tech Spec 3.6.2.2 requires four separate and independent containment recirculation spray subsystems. With one subsystem inoperable, restore within seven days.

Due to the arrangement of this section of piping, the section cannot be isolated without removing two heat exchangers from OPERABLE status. Therefore, this section pipe will be cleaned during a maintenance outage.

PLANS FOR COMPENSATORY ACTION:

There are no plans for compensatory action since the unit will be in cold shut down for refueling.

The potential flooding from a 16"Ø motor operated valve into the quench spray building basement will be avoided by tagging out the isolation valves in accordance with Station Administrative Procedures.

Cleaning this segment is not effected by work on other segments since, the cleaning takes place during a maintenance outage.

PIPING PRESERVATION PROJECT - HYDROLASING PLANNING SHEET

PIPE SEGMENT I.D.:	32 Type D
DESIGN CHANGE:	84-103
LOCATION:	Safeguards
PIPE LINE NUMBERS:	16"-39
PIPE SEGMENT BOUNDARIES:	Between MOV's
REFERENCE DRAWINGS:	WS-14B
ISOLATION REQUIREMENTS:	Line 16"-39
PIPING MODIFICATIONS:	None
VALVES TO BE REPAIRED:	1-MOV-106A
LENGTH OF PIPE TO BE CLEANED:	50' of 16"Ø and 40' of 24"Ø Pipe

TECHNICAL SPECIFICATIONS:

Tech Spec 3.6.2.2 requires four separate and independent containment recirculation spray subsystems. With one subsystem inoperable, restore within seven days.

Due to the arrangement of this section of piping, the section cannot be isolated without removing two heat exchangers from OPERABLE status. Therefore, this section pipe will be cleaned during a maintenance outage.

PLANS FOR COMPENSATORY ACTION:

There are no plans for compensatory action since the unit will be in cold shut down for refueling.

The potential flooding from a 16"Ø motor operated valve into the quench spray building basement will be avoided by tagging out the isolation valves in accordance with Station Administrative Procedures.

Cleaning this segment is not effected by work on other segments since, the cleaning takes place during a maintenance outage.

PIPING PRESERVATION PROJECT - HYDROLASING PLANNING SHEET

PIPE SEGMENT I.D.:	33 Type E
DESIGN CHANGE:	84-104
LOCATION:	Containment & Safeguards
PIPE LINE NUMBERS:	Unit 1 Recirc Spray HX
PIPE SEGMENT BOUNDARIES:	HX's to valves
REFERENCE DRAWINGS:	WS-12B
ISOLATION REQUIREMENTS:	Refueling outage
PIPING MODIFICATIONS:	None
VALVES TO BE REPAIRED:	1-MOV-103A, 103B, 103C, 103D, 104A, 104B, 104C and 104D
LENGTH OF PIPE TO BE CLEANED:	450' of 16'Ø Pipe

TECHNICAL SPECIFICATIONS:

Work on this section of pipe will require dismantling of valves needed for containment isolation. (Tech Spec 3.6.1.1 "Containment Integrity") Therefore, this section of pipe will be cleaned during a refueling outage.

PLANS FOR COMPENSATORY ACTION:

There are no plans for compensatory action since the unit will be in cold shut down for refueling.

The potential flooding from a 16"Ø motor operated valve into the containment sumps will be avoided by tagging out the isolation valves in accordance with Station Administrative Procedures.

Cleaning this segment is not effected by work on other segments, since the cleaning takes place during a refueling outage.

PIPING PRESERVATION PROJECT - HYDROLASING PLANNING SHEET

PIPE SEGMENT I.D.:	34 Type A
DESIGN CHANGE:	84-105
LOCATION:	Yard & Circulating Water Structure
PIPE LINE NUMBERS:	24"-425 & 25
PIPE SEGMENT BOUNDARIES:	Pumps to Valve House
REFERENCE DRAWINGS:	WS-4B, WS-9A, WS-9C
ISOLATION REQUIREMENTS:	Lines 24"-425 & 25
PIPING MODIFICATIONS:	Install internal plastic liner
VALVES TO BE REPAIRED:	None
LENGTH OF PIPE TO BE CLEANED:	100' of 8"Ø pipe and 160' of 24"Ø pipe

TECHNICAL SPECIFICATIONS:

Work on this section of pipe will not require the isolation of the main header or any branch of the service water loop. In addition, no other Technical Specifications address the auxiliary service water pumps or lines; therefore, work done on this section will not require the initiation of any action statements. Determination of coating requirements will be made before cleaning is begun.

PLANS FOR COMPENSATORY ACTION:

Compensatory measures are not required since the Technical Specification does not address the auxiliary service water piping.

The potential flooding of valve pit and yard from a 24"Ø valve will be avoided by tagging out the isolation valves in accordance with Station Administrative Procedures.

PIPING PRESERVATION PROJECT - HYDROLASING PLANNING SHEET

PIPE SEGMENT I.D.:	35
DESIGN CHANGE:	84-106
LOCATION:	SW Pumphouse
PIPE LINE NUMBERS:	Main Supply Headers
PIPE SEGMENT BOUNDARIES:	N/A
REFERENCE DRAWINGS:	N/A
ISOLATION REQUIREMENTS:	36"-1, 2, 3 and 4 (individual isolations)
PIPING MODIFICATIONS:	Add 4" vents to aid in draining of main headers
VALVES TO BE REPAIRED:	None
LENGTH OF PIPE TO BE CLEANED:	None

TECHNICAL SPECIFICATIONS:

Tech Spec 3.7.4.1 states "at least two service water loops (shared with other unit) shall be OPERABLE."

The action statement requires the restoration of two loops to OPERABLE status within 72 hours or be in at least hot standby within the next 6 hours and in cold shutdown within the following 30 hours. This action statement applies to both units and would require both units to take the same action should the system not be restored. Work on this section will require the draining of one main supply header and one main return header. The draining of the headers, installation of the modification, and the restoration of operability will be completed within the 72 hour action statement.

PLANS FOR COMPENSATORY ACTION:

Compensatory measures will be taken to maintain service water to the Charging Pump Coolers in the event that the unisolated supply or return header fails while installing the 4"Ø vent. Alternate supply and return water lines will be provided to the Charging Pump Coolers before starting the work. The supply and return lines will have a temporary spool piece installed with a hose connected from the supply temporary spool piece to the fire protection supply, and from the return temporary spool piece to a main header return line. Valves have been added to prevent depressurizing the supply line and minimizing leakage on the return line due to cuts or damaged sections in the fire hose. This alternate supply water may be brought into service quickly by closing a branch line valve and opening the fire valve. Closing a branch line valve and opening a small main header branch valve will allow using the alternate return line. If the on-line service water loop fails while the 4" vent is being installed, the hole will be plugged within minutes using a Dresser Repair Clamp. Construction personnel will be on location to perform any emergency installation.

In a LOCA event, the redundant supply line will be brought back on line by utilizing the Dresser repair clamp.

The potential flooding from a 4"Ø opening into the service pump house is avoided by tagging isolation valves in accordance with Station Administrative Procedures.

PIPING PRESERVATION PROJECT - HYDROLASING PLANNING SHEET

This work will provide a vent to allow draining the main service water headers and will be performed prior to other work.

APPENDIX B

OPTIONS WHICH HAVE BEEN DEVELOPED

The following section describes the plans for mechanical cleaning of the service water system. Other alternatives are also discussed. The pros and cons for each option are presented. All are within the existing Technical Specifications except as noted in Plan 4.

1.0 Plan 1, the Original

This is the plan and schedule presented in the December 5, 1984 meeting with the NRC in Bethesda. It is based on 72 hour action statements and requires all isolations over the shortest period of time. Periods of isolation are separated by seven days except for one package (DCP 84-86) which has several short branch line isolations spaced by a cleaning time requiring no isolation. This plan entails the cleaning of one section at a time and, therefore, provides the most control over cleaning and restoration of the service water system. This approach also makes the best utilization of the manpower and equipment resources, and does not require outages specifically for this work.

A total of 28 separate header or branch line isolations are anticipated for this plan, ten of which will last less than five hours. The total time of isolation is estimated to be approximately 1,346 hours. These isolations will be spread over a time period of approximately 7,920 hours (11 months). Main or branch headers

will be isolated approximately 17 percent of time during completion of the work. Each period of isolation required to complete pipe cleaning and valve repairs will be separated by a minimum separation of 7 days of normal operation. However, half of the ten 5 hour long isolations required by work package DCP 84-86 will be separated by a period of approximately 5 hours. These periods of isolation will affect only the component cooling heat exchangers.

2.0 Plan 2 - Consolidate 72 Hour Packages

This plan combines certain packages which could be worked together, thereby reducing the number of isolation periods. This approach compounds the problem of controlling the work being performed and increases the chances of having to shut down two units because of this work. The fall maintenance outages would also have to be extended to facilitate this work.

A total of 22 separate header or branch line isolations are anticipated for this plan, ten of which will last less than five hours. The total time of isolation is estimated to be approximately 914 hours. These isolations will be spread over a time period of approximately 10,800 hours (15 months). Main or branch headers will be isolated approximately 9 percent of time during completion of the work. Each period of isolation required to complete pipe cleaning and valve repairs will be separated by a minimum separation of 14 days of normal operation. However, half of the ten 5 hour long isolations required by work package DCP 84-86 will be

separated by a period of approximately 5 hours. These periods of isolation will affect only the component cooling heat exchangers.

3.0 Plan 3 - Stretch Out Isolations

This plan takes the same packages as in Plan 1 and doubles the time between isolations to 14 days. This is in response to the expressed concern of an LCO cyclic effect in Plan 1. Plan 3 poses the problem of keeping the trained and dedicated people on board for the length of the project. It does not reduce the number of isolations.

A total of 28 separate header or branch line isolations are anticipated for this plan, ten of which will last less than five hours. The total time of isolation is estimated to be approximately 1,346 hours. These isolations will be spread over a time period of approximately 10,800 hours (15 months). Main or branch headers will be isolated approximately 12 percent of time during completion of the work. Each period of isolation required to complete pipe cleaning and valve repairs will be separated by a minimum separation of 14 days of normal operation. However, half of the ten 5 hour long isolations required by work package DCP 84-86 will be separated by a period of approximately 5 hours. These periods of isolation will affect only the component cooling heat exchangers.

4.0 Plan 4 - Consolidate for Extended Technical Specification

This plan is based on utilizing an extended action statement which will be requested in a future license amendment. Based on a March 1985 Vepco submittal, we target NRC approval of the license amendment in September 1985. This licensing action would allow consolidation of several packages to be worked at the same time without outages and would cut the number of main header isolations in Plan 1 by as much as one-half. Initially, work would be performed during 72 hour action statements until such time as the Technical Specification change is approved. Thereafter, work would be accomplished during extended action statements.

A total of 18 separate header or branch line isolations are anticipated for this plan, ten of which will last less than five hours. The total time of isolation is estimated to be approximately 1,010 hours. These isolations will be spread over a time period of approximately 7,200 hours (10 months). Main or branch headers will be isolated approximately 14 percent of time during completion of the work. Each period of isolation required to complete pipe cleaning and valve repairs will be separated by minimum separation of 14 days of normal operation. However, half of the ten 5 hour long isolations required by work package DCP 84-86 will be separated by a period of approximately 5 hours. These periods of isolation will affect only the component cooling heat exchangers.

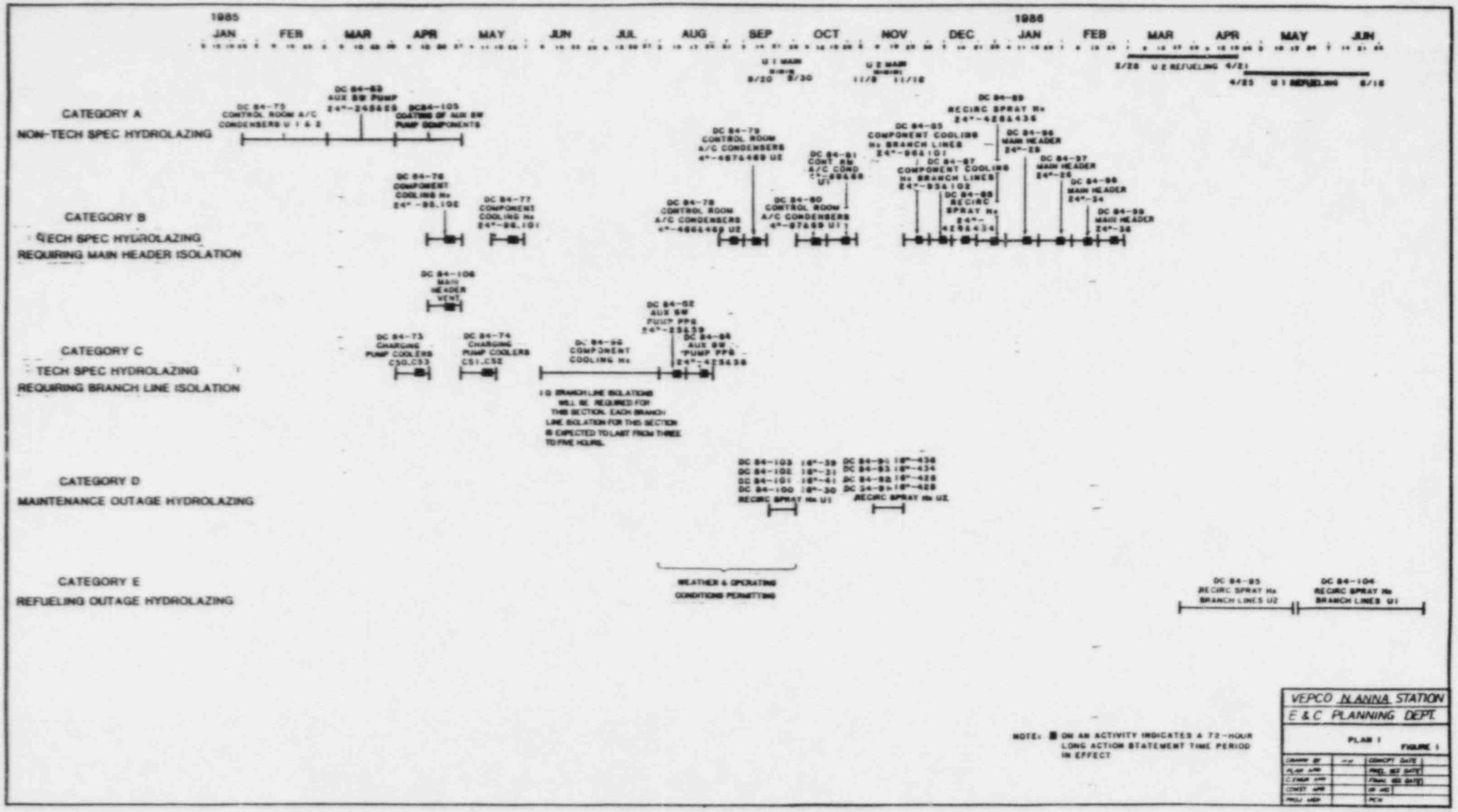
5.0 Plan 5 - Two Unit Outage

The cleaning during a two unit outage would resolve most of the Technical Specification concerns. However, it poses several burdens:

a. It would require several weeks of down time requiring more expensive replacement power.

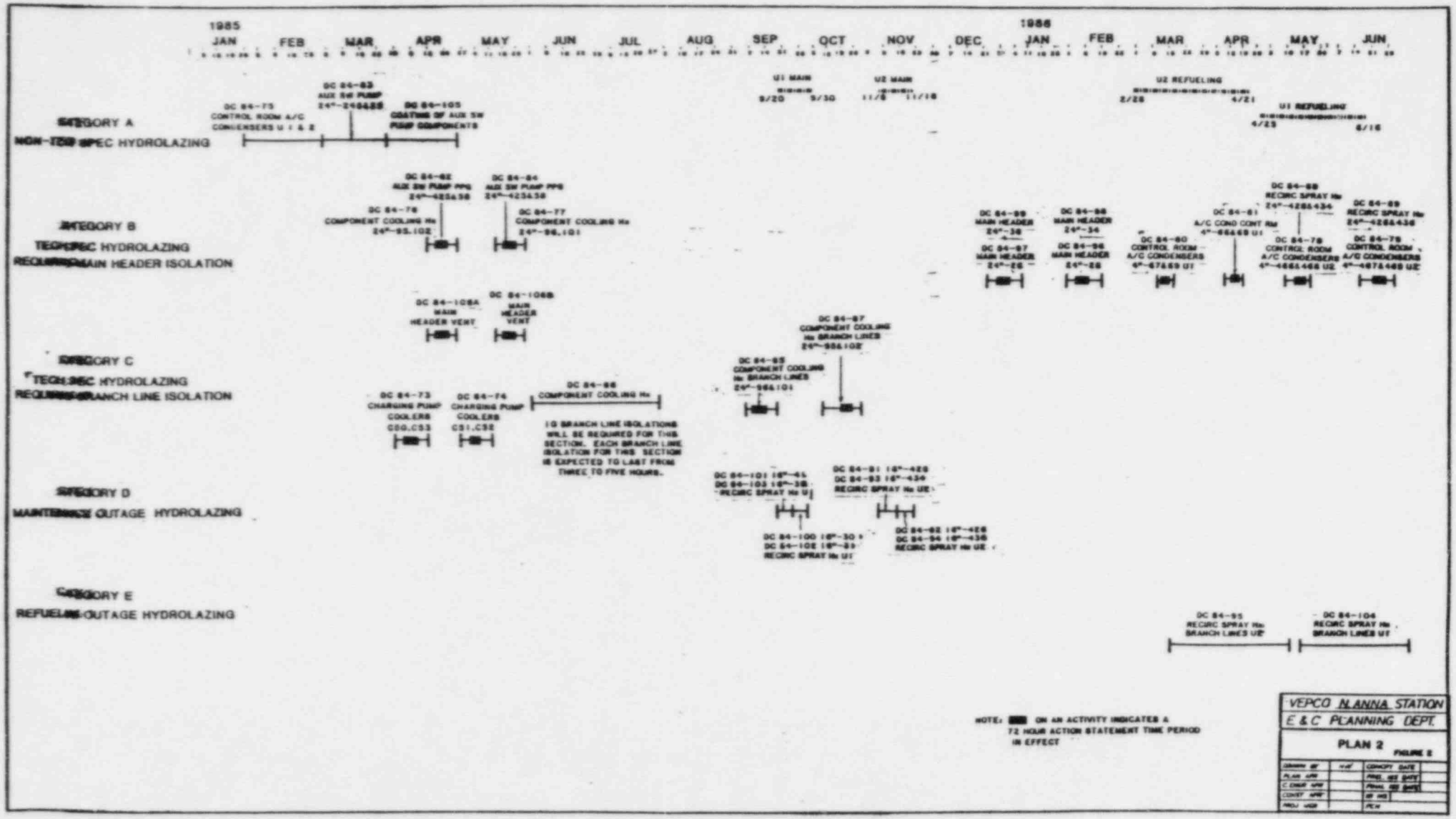
b. Performing the work over such a compressed schedule would severely impair the resources of the company to provide the specialized equipment and manpower.

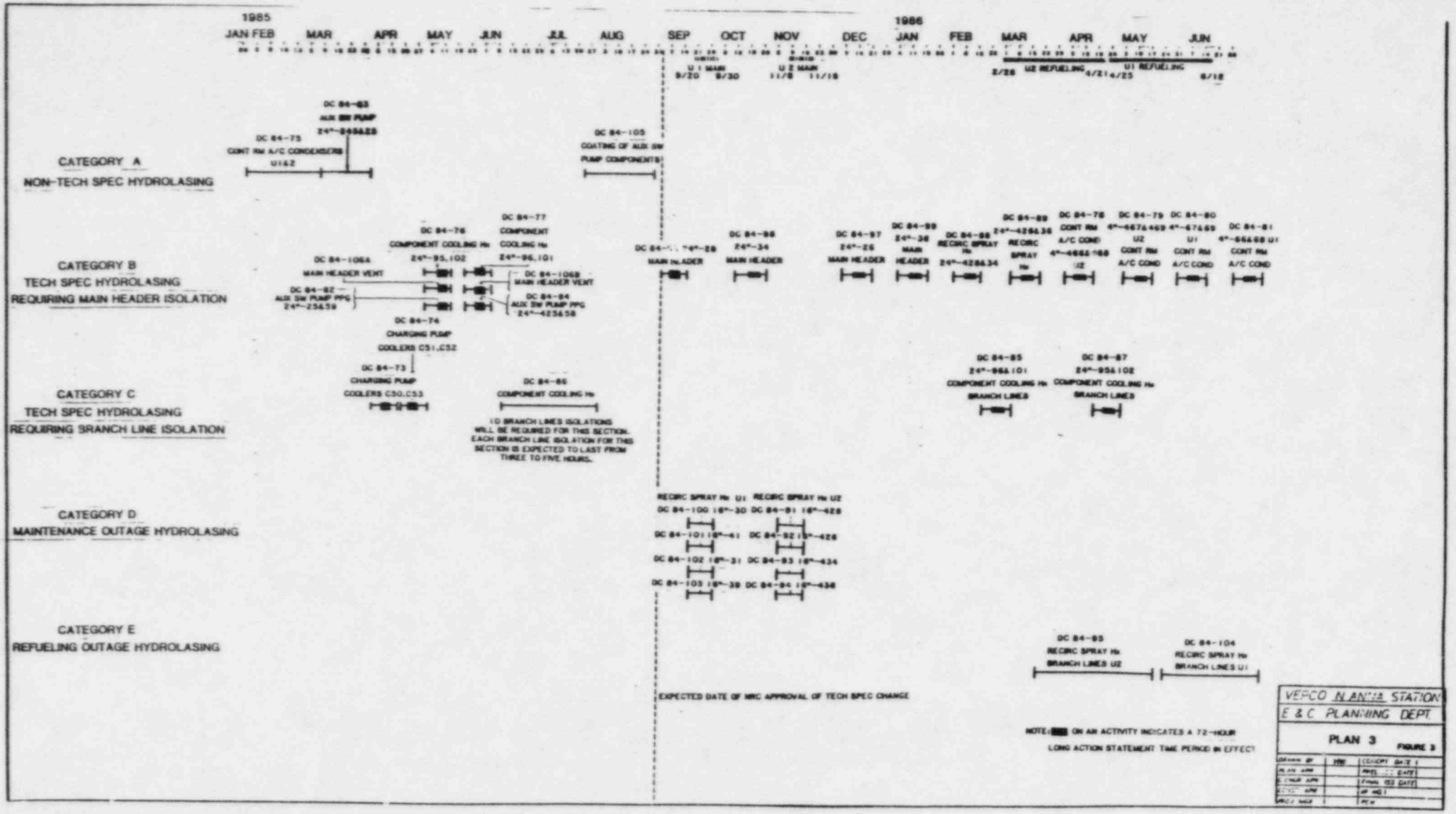
c. It does not allow the isolation of both headers due to the fact that service water is needed even during intermediate, cold and refueling shut down conditions.

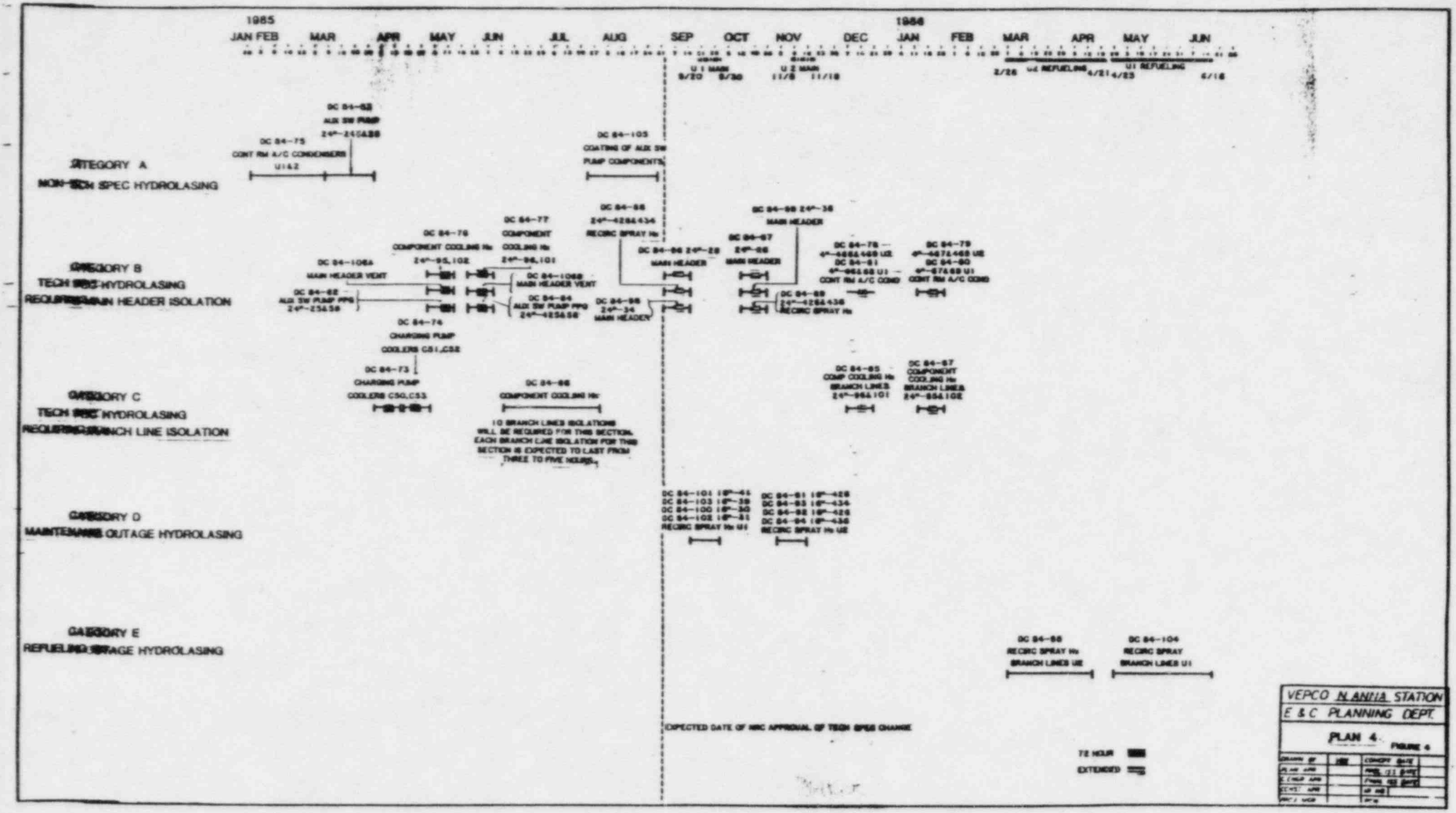


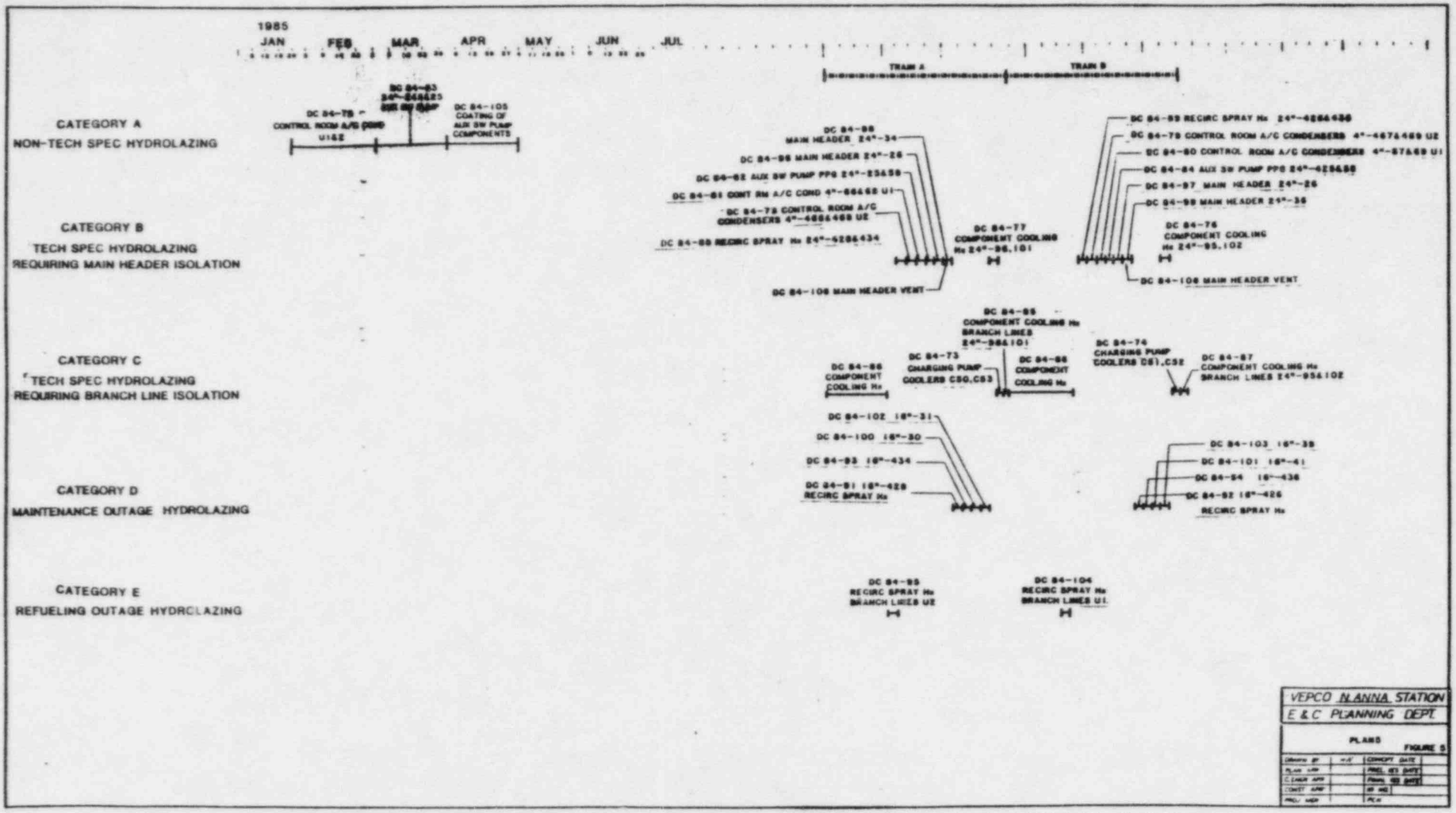
NOTE: ■ ON AN ACTIVITY INDICATES A 72-HOUR LONG ACTION STATEMENT TIME PERIOD IN EFFECT

VEPCO NANNA STATION
E & C PLANNING DEPT.
PLAN 1
FIGURE 1


1985
JAN
FEB
MAR
APR
MAY
JUN
JUL
AUG
SEP
OCT
NOV
DEC
1986
JAN
FEB
MAR
APR
MAY
JUN
U1 MAIN
9/20
9/30
U2 MAIN
11/8
11/18
U2 REFUELING
2/28
4/21
U1 REFUELING
4/23
6/16
CATEGORY A
NON-TECH SPEC HYDROLAZING
DC 84-75
CONTROL ROOM A/C
CONDENSERS U 1 & 2
DC 84-83
AUX SW PUMP
24"-2484SS
DC 84-105
COATING OF AUX SW
PUMP COMPONENTS
CATEGORY B
TECH SPEC HYDROLAZING
REQUIRES MAIN HEADER ISOLATION
DC 84-82
AUX SW PUMP PPG
24"-4254.SS
DC 84-84
AUX SW PUMP PPG
24"-4254.SS
DC 84-76
COMPONENT COOLING Hx
24"-SS.102
DC 84-77
COMPONENT COOLING Hx
24"-SS.101
DC 84-89
MAIN HEADER
24"-38
DC 84-87
MAIN HEADER
24"-28
DC 84-86
MAIN HEADER
24"-34
DC 84-96
MAIN HEADER
24"-28
DC 84-80
CONTROL ROOM
A/C CONDENSERS
4"-67&69 U1
DC 84-81
A/C COND CONT Rm
4"-66&68 U1
DC 84-88
RECIRC SPRAY Hx
24"-4284434
DC 84-78
CONTROL ROOM
A/C CONDENSERS
4"-466&468 U2
DC 84-89
RECIRC SPRAY Hx
24"-4284434
DC 84-79
CONTROL ROOM
A/C CONDENSERS
4"-467&469 U2
CATEGORY C
TECH SPEC HYDROLAZING
REQUIRES BRANCH LINE ISOLATION
DC 84-108A
MAIN
HEADER VENT
DC 84-108B
MAIN
HEADER
VENT
DC 84-87
COMPONENT COOLING
Hx BRANCH LINES
24"-SS&102
DC 84-85
COMPONENT COOLING
Hx BRANCH LINES
24"-SS&101
DC 84-73
CHARGING PUMP
COOLERS
CS0,CS3
DC 84-74
CHARGING PUMP
COOLERS
CS1,CS2
DC 84-86
COMPONENT COOLING Hx
10 BRANCH LINE ISOLATIONS
WILL BE REQUIRED FOR THIS
SECTION. EACH BRANCH LINE
ISOLATION FOR THIS SECTION
IS EXPECTED TO LAST FROM
THREE TO FIVE HOURS.
CATEGORY D
MAINTENANCE OUTAGE HYDROLAZING
DC 84-101 16"-45
DC 84-103 16"-38
RECIRC SPRAY Hx U1
DC 84-91 16"-428
DC 84-93 16"-434
RECIRC SPRAY Hx U2
DC 84-100 16"-30
DC 84-102 16"-33
RECIRC SPRAY Hx U1
DC 84-92 16"-428
DC 84-94 16"-436
RECIRC SPRAY Hx U2
CATEGORY E
REFUELING OUTAGE HYDROLAZING
DC 84-95
RECIRC SPRAY Hx
BRANCH LINES U2
DC 84-104
RECIRC SPRAY Hx
BRANCH LINES U1
NOTE: ■■■ ON AN ACTIVITY INDICATES A
72 HOUR ACTION STATEMENT TIME PERIOD
IN EFFECT
VEPCO NLANNA STATION
E & C PLANNING DEPT.
PLAN 2
FIGURE 2


1985
JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC
1986
JAN FEB MAR APR MAY JUN
U1 MAIN 9/20 9/30
U2 MAIN 11/8 11/15
2/28 U2 REFUELING 4/21 4/25
U1 REFUELING 6/18
CATEGORY A
NON-TECH SPEC HYDROLASING
DC 84-75
CONT RM A/C CONDENSERS U1&2
DC 84-83
AUX SW PUMP
24"-956&23
DC 84-105
COATING OF AUX SW PUMP COMPONENTS
CATEGORY B
TECH SPEC HYDROLASING
REQUIRING MAIN HEADER ISOLATION
DC 84-76
COMPONENT COOLING Hx
24"-95,102
DC 84-77
COMPONENT COOLING Hx
24"-96,101
DC 84-1064
MAIN HEADER VENT
DC 84-1068
MAIN HEADER VENT
DC 84-82
AUX SW PUMP PPG
24"-25&59
DC 84-84
AUX SW PUMP PPG
24"-425&58
DC 84-74
CHARGING PUMP
COOLERS C51,C52
DC 84-73
CHARGING PUMP
COOLERS C50,C53
DC 84-98
24"-34
MAIN HEADER
DC 84-97
24"-25
MAIN HEADER
DC 84-89
24"-36
MAIN HEADER
DC 84-88
RECIRC SPRAY Hx
24"-428&34
DC 84-89
24"-428&36
RECIRC SPRAY Hx
DC 84-78
CONT RM A/C COND U2
4"-466&468
DC 84-79
U2 CONT RM A/C COND
4"-467&469
DC 84-80
U1 CONT RM A/C COND
4"-674&69
DC 84-81
CONT RM A/C COND
4"-664&68 U1
CATEGORY C
TECH SPEC HYDROLASING
REQUIRING BRANCH LINE ISOLATION
DC 84-86
COMPONENT COOLING Hx
10 BRANCH LINES ISOLATIONS WILL BE REQUIRED FOR THIS SECTION. EACH BRANCH LINE ISOLATION FOR THIS SECTION IS EXPECTED TO LAST FROM THREE TO FIVE HOURS.
DC 84-85
24"-96&101
COMPONENT COOLING Hx
BRANCH LINES
DC 84-87
24"-956&102
COMPONENT COOLING Hx
BRANCH LINES
CATEGORY D
MAINTENANCE OUTAGE HYDROLASING
RECIRC SPRAY Hx U1
DC 84-100 16"-30
DC 84-101 16"-41
DC 84-102 16"-31
DC 84-103 16"-39
RECIRC SPRAY Hx U2
DC 84-91 16"-428
DC 84-92 16"-426
DC 84-93 16"-434
DC 84-94 16"-436
CATEGORY E
REFUELING OUTAGE HYDROLASING
DC 84-93
RECIRC SPRAY Hx
BRANCH LINES U2
DC 84-104
RECIRC SPRAY Hx
BRANCH LINES U1
EXPECTED DATE OF NRC APPROVAL OF TECH SPEC CHANGE
NOTE: ■■■ ON AN ACTIVITY INDICATES A 72-HOUR LONG ACTION STATEMENT TIME PERIOD IN EFFECT
VEPCO NUCLEAR STATION
E & C PLANNING DEPT
PLAN 3
FIGURE 3


1985
JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC
1986
JAN FEB MAR APR MAY JUN
U1 MAIN 8/20 8/30
U2 MAIN 11/8 11/18
2/28 U2 REFUELING 4/21
4/25 U1 REFUELING 6/16
CATEGORY A
NON-TECH SPEC HYDROLASING
DC 84-62 AUX SW PUMP 24"-25458
DC 84-75 CONT RM A/C CONDENSERS U1&2
DC 84-105 COATING OF AUX SW PUMP COMPONENTS
CATEGORY B
TECH SPEC HYDROLASING
REQUIRES MAIN HEADER ISOLATION
DC 84-106A MAIN HEADER VENT
DC 84-62 AUX SW PUMP PPG 24"-25458
DC 84-76 COMPONENT COOLING Hx 24"-95,102
DC 84-77 COMPONENT COOLING Hx 24"-96,101
DC 84-106B MAIN HEADER VENT
DC 84-64 AUX SW PUMP PPG 24"-4256458
DC 84-74 CHARGING PUMP COOLERS CS1,CS2
DC 84-66 24"-4284434 RECIRC SPRAY Hx
DC 84-86 24"-28 MAIN HEADER
DC 84-98 24"-34 MAIN HEADER
DC 84-98 24"-36 MAIN HEADER
DC 84-67 24"-86 MAIN HEADER
DC 84-88 24"-4284434 RECIRC SPRAY Hx
DC 84-78 4"-4684468 UE
DC 84-81 6"-9668 U1 CONT RM A/C COND
DC 84-79 4"-4674468 UE
DC 84-80 6"-6768 U1 CONT RM A/C COND
CATEGORY C
TECH SPEC HYDROLASING
REQUIRES BRANCH LINE ISOLATION
DC 84-73 CHARGING PUMP COOLERS CS0,CS3
DC 84-65 COMP COOLING Hx BRANCH LINES 24"-96&101
DC 84-87 COMPONENT COOLING Hx BRANCH LINES 24"-854102
DC 84-66 COMPONENT COOLING Hx
10 BRANCH LINES ISOLATIONS WILL BE REQUIRED FOR THIS SECTION. EACH BRANCH LINE ISOLATION FOR THIS SECTION IS EXPECTED TO LAST FROM THREE TO FIVE HOURS.
CATEGORY D
MAINTENANCE OUTAGE HYDROLASING
DC 84-101 18"-46
DC 84-103 18"-38
DC 84-100 18"-30
DC 84-102 18"-81
RECIRC SPRAY Hx U1
DC 84-81 18"-428
DC 84-83 18"-434
DC 84-82 18"-426
DC 84-84 18"-436
RECIRC SPRAY Hx UE
CATEGORY E
REFUELING OUTAGE HYDROLASING
DC 84-88 RECIRC SPRAY Hx BRANCH LINES UE
DC 84-104 RECIRC SPRAY BRANCH LINES U1
EXPECTED DATE OF NRC APPROVAL OF TECH SPEC CHANGE
72 HOUR
EXTENDED
VEPCO HLANTIA STATION
E & C PLANNING DEPT.
PLAN 4
FIGURE 4


1985
JAN
FEB
MAR
APR
MAY
JUN
JUL
TRAIN A
TRAIN B
CATEGORY A
NON-TECH SPEC HYDROLAZING
DC 84-105
COATING OF
AUX SW PUMP
COMPONENTS
CATEGORY B
TECH SPEC HYDROLAZING
REQUIRING MAIN HEADER ISOLATION
DC 84-77
COMPONENT COOLING
Hx 24"-96,101
DC 84-76
COMPONENT COOLING
Hx 24"-95,102
DC 84-106 MAIN HEADER VENT
CATEGORY C
TECH SPEC HYDROLAZING
REQUIRING BRANCH LINE ISOLATION
DC 84-86
COMPONENT
COOLING Hx
DC 84-73
CHARGING PUMP
COOLERS CSG,CS3
DC 84-88
COMPONENT
COOLING Hx
DC 84-74
CHARGING PUMP
COOLERS CS1,CS2
DC 84-87
COMPONENT COOLING Hx
BRANCH LINES 24"-95&102
CATEGORY D
MAINTENANCE OUTAGE HYDROLAZING
CATEGORY E
REFUELING OUTAGE HYDROLAZING
DC 84-93
RECIRC SPRAY Hx
BRANCH LINES U2
DC 84-104
RECIRC SPRAY Hx
BRANCH LINES U1
VEPCO NANNA STATION
E & C PLANNING DEPT.
PLANS
FIGURE 5

APPENDIX B
FIGURE 6
COMPARISON OF PLANS

Plan No.	Number of Isolations	Total Duration of Isolation Hours	Time Between 1st/Last Isolation Months	Percent Isolation Time	Minimum Time Between Isolation* Days
1	28	1,346	11	17%	7
2	22	914	15	9%	14
3	28	1,346	15	12%	14
4	18	1,010	10	14%	14

*Except for the 10 five-hour isolations in DCP 84-86.

APPENDIX C
PERSONNEL REQUIREMENTS, RESPONSIBILITIES AND COMMITMENTS

PERSONNEL	RESPONSIBILITIES	COMMITMENT
Project Management Engineer	1. Provide overall coordination and control of all project activities. 2. Insure proper interface with other service water projects. 3. Monitor project progress and provide reports to management. 4. Assist in resolution of technical and procedural problems. 5. Provide interface with management.	As required (approximately 75% of full time)
Coordinator	1. Assist the Project Management Engineer in the day to day coordination of project activities and on the preparation of status reports. 2. Prioritize project work activities to insure maximum use of isolation time. 3. Insure that proper interface between working groups occurs. 4. Insure that appropriate working groups are notified prior to implementation of work packages to allow adequate time for preparation.	Full time for one Coordinator
Mechanical Engineer	1. Determine scope of modification required to implement each hydrolasing activity. 2. Determine methods of recovering drained service water and hydrolaser waste product. 3. Prepare implementing documentation (EWRs and DCPs) to control Construction activities. 4. Determine piping segment boundaries. 5. Provide full time support during hydrolasing and valve repair activities to insure timely resolution to technical problems. 6. Review valve isolation capabilities and determine required valve repairs. 7. Specify valve repair parts. 8. Review North Anna 3 & 4 butterfly documentation to determine acceptability for use on Units 1 and 2 service water system. 9. Provide schedule inputs for all engineering activities.	Full time for Engineers (additional support may be required while around the clock hydrolasing is being performed and as required to maintain the project schedule.
Station Operator	1. Prepare temporary operating procedures and/or jumpers required to determine valve isolation capabilities. 2. Prepare any temporary operating procedures and/or jumpers required to allow the hydrolasing and valve repair work to be performed during plant operation. 3. Prepare all required tag reports and prepare tags as required.	Full time for one operator that is knowledgeable of the SW system. (Additional support will be required at various times.)

PERSONNEL	RESPONSIBILITIES	COMMITMENT
Station Operator (cont'd)	4. Arrange for all valve manipulations required to achieve designated isolations. 5. Review implementation procedures for operational acceptability. 6. Provide schedule inputs pertaining to system isolation time requirements. 7. Communicate with Control Room. 8. Maintain Status Board. 9. Maintain Action Log (with Shift Supervisor). 10. Confirm compensatory measures.	
Advisory Operations	1. Provide all required testing procedures. 2. Assist, as requested, in resolution of operational concerns and problems. 3. Perform required testing.	As required. (Performance of testing must be on a priority basis.)
Construction Engineering	1. Revise erection isometrics to reflect any modifications. 2. Prepare weld data packs. 3. Review implementation procedures to insure that adequate instructions are provided. 4. Coordinate construction activities. 5. Provide schedule inputs pertaining to all construction activities. 6. Determine construction manpower requirements and arrange for those requirements to be met.	As required (Approximately 60-70% of full time. Additional support may be required at times of peak activity.)
Health Physics	1. Insure that proper ALARA considerations are included in all in-plant activities. 2. Sample all waste product released from the plant. 3. Perform decontamination and cleanup of waste spillage in potentially contaminated areas. 4. Prepare and issue the required Radiation Work Permits.	As required. (Sampling of wastes must be done on a priority basis.)
Planning	1. Prepare and maintain all project schedules. (a) Level 3 overall (b) Hour by hour for hydrolasing and valve repairs.	Full time for One Planner
Purchasing	1. Procure all required materials. 2. Expedite delivery as necessary.	As required.
Quality Control	1. Review implementation documentation during development to insure that proper QC Holds, etc. are included. 2. Provide continuous coverage of work activities during periods of isolation. 3. Perform all inspections as required by procedures. 4. Coordinate coverage by Station NDE and the Insurance Inspector.	As required.