

# ***Plant Hatch License Renewal Application***



# ***Agenda***

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- Introduction***
- Background and Objective***
- Plant Hatch License Renewal Project  
Overview***
- License Renewal Application Contents***

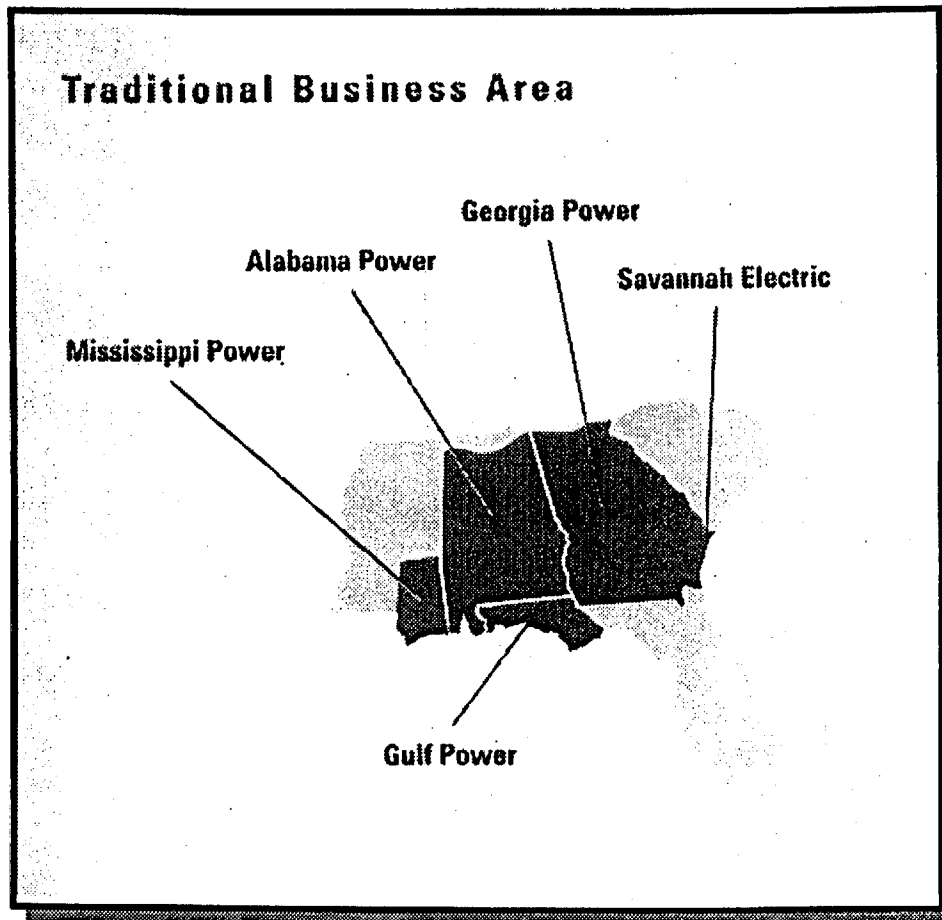
# ***Introduction***

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## ***Who we are -***

- SNC is a wholly-owned subsidiary of Southern Company, the largest producer of electricity in the U.S.***
- The licensee operator and agent for the owners of Plants Farley, Hatch, and Vogtle***

# *Introduction*



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# **Introduction**

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## ***Our industry participation -***

- SNC has maintained participation in BWR Owners Group license renewal activities since 1989 and WOG license renewal activities since 1992***
- SNC participates in the NEI and EPRI License Renewal efforts***
  - Ongoing activities include resolving generic license renewal issues, work on revising NEI 95-10 (industry guidance for license renewal), input to update of the Standard Review Plan, the GALL report, etc.*

# **Introduction**

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***Utilize monthly management meetings to maintain SNC and NRC focus on process***

- Continue meetings similar to the Calvert Cliffs/NRC meetings to***
  - brief NRC line management on progress of license renewal application review*
  - determine if any issues need elevating to NRC Steering Committee by SNC or NRC*
  - establish performance indicators for next review meeting, such as schedule adherence, quality of work, communications, regulatory stability, accomplishments, and concerns*

# ***Background, Objective and Project Overview***



# **Background**

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- Unit 1's current license expires in August 2014*
- Unit 2's current license expires in June 2018*
- 10 CFR 54 allows the issuance of a renewed license for an additional 20 years*
- SNC plans to request renewal of the licenses by filing an application in February 2000*
- When approved, the renewed licenses would allow continued operation until August 2034 and June 2038 for Units 1 and 2 respectively*



# **Objective**

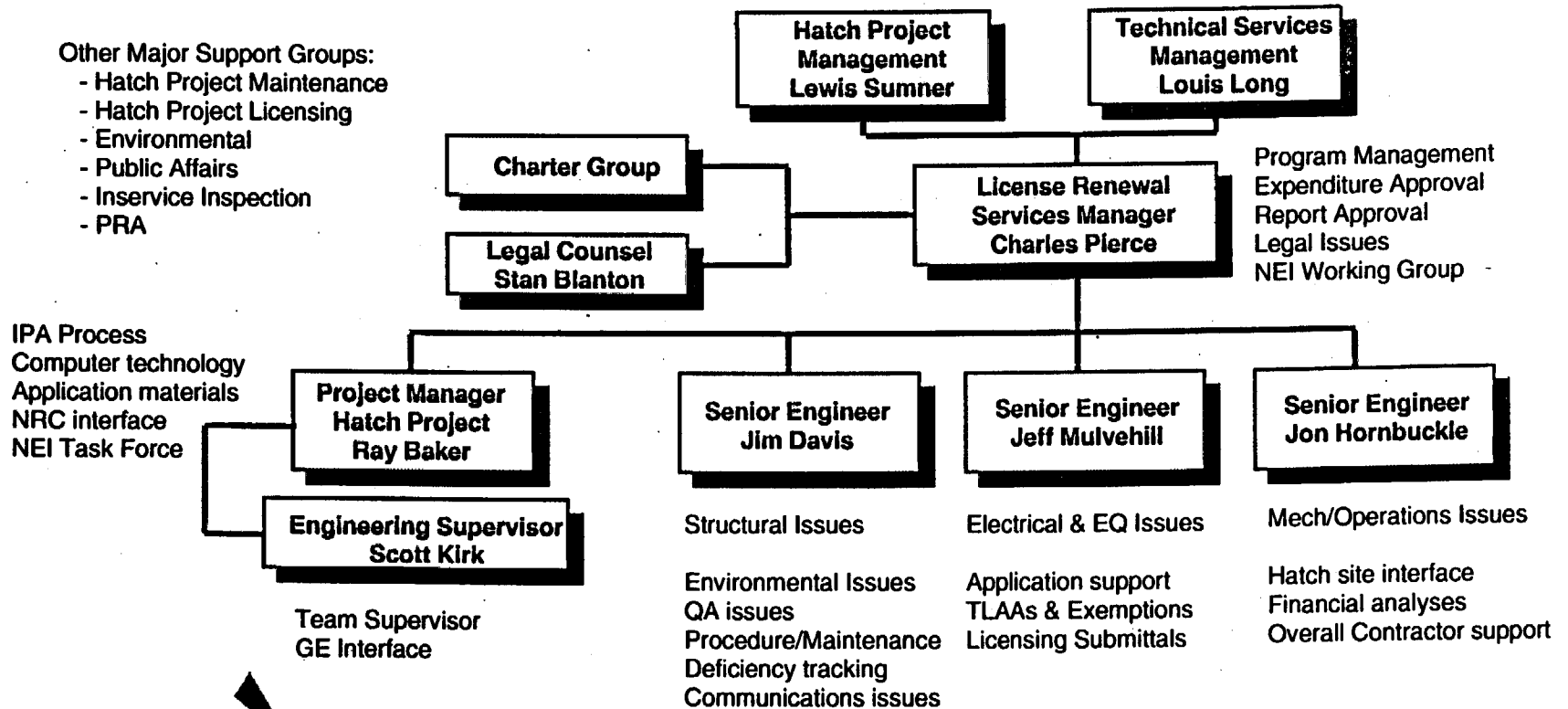
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***Obtain a renewed license for Plant Hatch in a timely and efficient manner based on:***

- Utilize the generic and relevant information from the BWRVIP Topical Reports***
- Implementing relevant lessons learned from the Calvert Cliffs and Oconee application review process***
- Improved guidance resulting from the Calvert Cliffs and Oconee experience***
- Coordinating with NRC to help ensure the Hatch application preparation and review process are effective, efficient, timely, and predictable***

# Project Overview

## Our project organization -



# ***Project Overview***

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## ***Application Approach -***

- Participated in NEI/EPRI issue resolution and incorporated relevant results***
- Monitored Calvert Cliffs and Oconee interactions with the NRC & incorporated relevant information***
- Used NRC's new standard format for the preparation of the Hatch Application***
- Conducted peer reviews of two drafts of the application and incorporated input***

# ***Project Overview***

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## ***Assembling the application - what we did -***

### ***– Provided general information pursuant to §54.19***

- General information specified in 10 CFR 50.33(a) - (e), (h), and (i) {§54.19(a)}***
- Included conforming changes to the standard indemnity agreement to account for the expiration term of the proposed renewed license {§54.19(b)}***



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# **Project Overview**

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## **Assembling the application - what we did -**

### **– Performed an Integrated Plant Assessment pursuant to §54.21(a)**

- *Identified and listed structures and components that are subject to an aging management review per §54.4(a) {§54.21(a)(1)}*
- *Described and justified the scoping and screening methodology used to identify and list {§54.21(a)(2)}*
- *Demonstrated for each structure and component subject to aging management review, that the effects of aging will be adequately managed so that the intended function(s) will be maintained consistent with the CLB for the period of extended operation {§54.21(a)(3)}*

# ***Project Overview***

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## ***Assembling the application - what we did -***

- Evaluated Time-Limited Aging Analyses (TLAAs) pursuant to §54.21(c)***
  - Identified and listed calculations and analyses that meet the criteria for TLAAs and dispositioned the TLAAs per one of the three demonstrations of §54.21(c)(1)(i)-(iii)*
  - Identified and listed plant-specific exemptions granted pursuant to 10 CFR 50.12 and in effect that are based on time-limited aging analyses {§54.21(c)(2)} --- there were none*

# ***Project Overview***

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## ***Assembling the application - what we did -***

- Produced an FSAR supplement pursuant to §54.21(d)***
  - Provided summary descriptions of programs and activities for managing the effects of aging*
  - Provided a summary of the evaluations of TLAA's for the period of extended operation*
- Provided Technical Specifications changes for the renewal term pursuant to §54.22***
- Produced an Environmental Report Supplement to comply with 10 CFR Part 51 pursuant to §54.23***

# Project Overview

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## **SNC Process -**

### **– Integrated Plant Assessment - Scoping**

- *SNC developed a comprehensive list of systems and structures and identified functions for each item on the list*
- *Each function was evaluated against the eight scoping criteria in 10 CFR 54.4(a)(1-3)*

### **– Integrated Plant Assessment - Screening**

- *As an aid to screening the structures and components, evaluation boundaries were produced for each in-scope function*
- *Structures and components within the evaluation boundaries were screened to identify those subject to aging management review*
- *The screening criteria used were those contained in 10 CFR 54.21(a)(1)(i) and (ii)*



# Project Overview

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## **SNC Process -**

### **– Integrated Plant Assessment - Aging Management Reviews**

- *Each structure or component subject to aging management review is included in one or more in-house reviews*
- *Aging management reviews were performed on a commodity basis (discussion of commodity groups follows)*
- *Aging effects requiring management were determined systematically for the commodity groups based on materials and environments*
- *Appropriate program coverage for the structures or components comprising each commodity group was identified or established*
- *The commodity group/programmatic coverage mapping process is similar to the approach in the GALL report*

# ***Project Overview***

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## ***SNC Process -***

### ***– Integrated Plant Assessment - Aging Management Reviews***

- Plant operating experience was reviewed to validate the determination of aging effects requiring management and as an aid to identify potential enhancement areas*
- Aging management reviews were summarized into the application (some grouping of AMRs)*
- The demonstration of adequate aging management is made for each commodity group*

# **Project Overview**

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## **SNC Process -**

### **– Time Limited Aging Analyses**

- *SNC created a list of calculations (in-house and A/E) to encompass those with a time-limited nature*
- *NSSS vendor was contacted separately to review their scope for TLAAs*
- *An initial screening was performed using criterion 3 - the time-limited nature of the calculation*
- *The remaining set of calculations was then screened using the remaining 5 criteria*
- *Both "actives" and "passives" were screened*
- *Separately, a CLB review was performed to assure a thorough review to identify potential TLAAs*



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# Project Overview

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## **SNC Process -**

### **– GSI's Addressed in Plant Hatch Application**

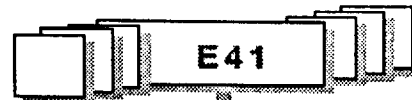
- ***GSI 168 - Environmental Qualification of Electrical Equipment***  
*EQ evaluations of electrical equipment are TLAA's. Therefore, this GSI is addressed in Section 4.4 of the Plant Hatch application.*
- ***GSI 190 - Fatigue Evaluation of Metal Components***  
*A number of thermal fatigue evaluations are TLAA's. Therefore, the issue associated with this GSI is addressed in Section 4.2 of the Plant Hatch application.*

# Project Overview

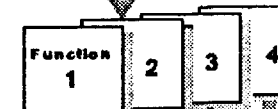
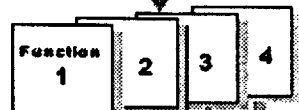
## SNC Process -

- *Component groups to commodity groups*

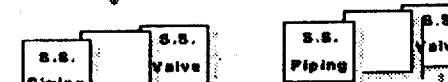
Systems Structures



In-Scope Functions



Components & Component Types Subject to AMR



Examine Environment & Materials



Component Grouping



Commodity Group



# ***Application Contents***

# ***Application Contents***

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- ***License Renewal Application Contents***
  - ***General Information (section 1)***
  - ***Structures and Components Requiring an Aging Management Review (section 2)***
    - *Methodology for scoping and screening*
    - *Identification of structures and components subject to aging management review ( scoping/screening results)*
  - ***Aging Management Review Results (section 3)***
    - *Discussion of process for merging component groups into commodities*
    - *Discussion of aging management review process*

# ***Application Contents***

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- ***License Renewal Application Contents (continued)***
  - ***Aging Management Review Results (section 3, contiuned)***
    - *Six-column tables (general overview of aging management reviews results - component types, materials, environments, aging effects requiring management, programs and activities credited)*
  - ***Time-Limited Aging Analyses (section 4)***
    - *Exemptions addressed (none)*



# ***Application Contents***

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- ***License Renewal Application Contents (continued)***
  - ***Final Safety Analysis Report Supplement (appendix A)***
    - *Descriptions of programs and activities for managing aging are contained in appendices A*
  - ***Identification of Aging Effects and Aging Management Review Summaries (appendix C)***
    - *C.1 presents an evaluation of aging effects requiring management*
    - *C.2 presents the summaries of the aging management reviews*
    - *The demonstrations are made in C.2, including the linkage of programs and activities to management of aging effects*



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# ***Application Contents***

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- ***License Renewal Application Contents (continued)***
  - ***Environmental Report Supplement (appendix D)***
  - ***Technical Specification Changes (appendix E)***
    - ***Pressure-temperature curve changes to extend operation through 54 effective full-power years***

# ***Aging Management Reviews***

# ***Aging Management Reviews***

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– ***Systematically identified aging effects requiring management for the following component internal environments:***

- *Reactor grade water*
- *Demineralized water*
- *Suppression Pool water*
- *Spent Fuel Pool water*
- *Borated water*
- *Closed cooling water*
- *Raw water*
- *Fuel oil*
- *Gas*

# ***Aging Management Reviews***

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- ***Systematically identified aging effects requiring management for the following component external environments:***
  - *Inside*
  - *Outside*
  - *Buried or Embedded*

# ***Aging Management Reviews***

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- ***Systematically identified aging effects requiring management for the following structure environments:***
  - *Inside*
  - *Outside*
  - *Buried or Embedded*
  - *Submerged*

# ***Aging Management Reviews***

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- ***Systematically identified aging effects requiring management for the following electrical component environments:***
  - *High temperature*
  - *Radiation*
  - *Moisture*

# ***Aging Management Reviews***

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- ***Total of 58 AMR summaries are provided in the application and summarize 111 AMRs***
  - *45 mechanical*
  - *5 electrical*
  - *8 civil/structural*
- ***EQ TLAAAs manage the vast majority of electrical components subject to aging management review***
- ***Thermal fatigue is managed by combinations of TLAAAs and aging management programs***



# ***Aging Management Reviews***

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## **– *Mechanical AMR Summaries***

- *45 mechanical AMR summaries*
- *6 mechanical Class 1 AMR summaries are supported by 7 AMRs on-site*
- *28 mechanical non-Class 1 AMR summaries are supported by 91 AMRs on-site*
- *6 mechanical non-Class 1 AMR summaries address fire protection components and are supported by 42 AMRs on-site*
- *3 mechanical AMR summaries address external surfaces*
- *2 AMR summary addresses thermal insulation and jacketing*

# ***Aging Management Reviews***

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- ***Electrical AMR Summaries***
  - *5 electrical AMR summaries for electrical components are provided, supported by 5 in-house AMRs*
  - *only 1 electrical AMR summary addresses an aging effect requiring management outside EQ*

# ***Aging Management Reviews***

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## **– *Civil/Structural AMR Summaries***

- *8 civil/structural AMR summaries are provided, supported by 8 in-house AMRs*

# ***AMR Summaries***

# ***6 Class 1 Mechanical AMR Summaries***

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1. Reactor Pressure Vessel
2. Reactor Pressure Vessel Internals
3. Class 1 Carbon Steel Components Within the Reactor Water Environment
4. Class 1 Wrought and Forged Stainless Steel Components Within the Reactor Water Environment
5. Class 1 Cast Austenitic Stainless Steel Components Within the Reactor Water Environment
6. Class 1 Pressure Boundary Bolting

# ***39 non-Class 1 Mechanical AMR Summaries***

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1. Carbon Steel Components Within the Reactor Water Environment
2. Stainless Steel Components Within the Reactor Water Environment
3. Carbon Steel Components Within the Demineralized Water Environment
4. Stainless Steel Components Within the Demineralized Water Environment
5. Condensate Storage Tanks
6. Carbon Steel Components Within the Suppression Pool Environment
7. Stainless Steel Components Within the Suppression Pool Environment
8. Carbon Steel Components Within the Borated Water Environment
9. Stainless Steel Components Within the Borated Water Environment
10. Carbon Steel Components Within the Closed Cooling Water Environment
11. Stainless Steel Components Within the Closed Cooling Water Environment
12. Copper Alloy Components Within the Closed Cooling Water Environment

# ***39 non-Class 1 Mechanical AMR Summaries (cont'd.)***

13. Carbon Steel Components Within the River Water Environment
14. Stainless Steel Components Within the River Water Environment
15. Copper Alloy Components Within the River Water Environment
16. Gray Cast Iron Components Within the River Water Environment
17. Carbon Steel Components Within the Fuel Oil Environment
18. Stainless Steel Components Within the Fuel Oil Environment
19. Carbon Steel Components Within the Dry Compressed Gas Environment
20. Stainless Steel Components Within the Dry Compressed Gas Environment
21. Copper Alloy Components Within the Dry Compressed Gas Environment
22. Carbon Steel Components Within the Humid or Wetted Gas Environment
23. Stainless Steel Components Within the Humid or Wetted Gas Environment
24. Copper Alloy Components Within the Humid or Wetted Gas Environment

# ***39 non-Class 1 Mechanical AMR Summaries (cont'd.)***

25. Galvanized Carbon Steel Components Within the Humid or Wetted Gas Environment
26. Carbon Steel Bolting Materials
27. Stainless Steel Bolting Materials
28. Residual Heat Removal Heat Exchangers
29. Water Based Fire Suppression Systems
30. Fire Protection Diesel Fuel Oil Supply System
31. Compressed Gas Based Fire Suppression Systems
32. Fire Penetration Seals
33. Cable Tray Fire Barriers
34. Fire Doors



# ***39 non-Class 1 Mechanical AMR Summaries (cont'd.)***

- 35. Commodity External Surfaces Exposed to an "Inside" Environment
- 36. Commodity External Surfaces Exposed to an "Outside" Environment
- 37. Commodity External Surfaces Exposed to a "Buried" or "Embedded" Environment
- 38. Thermal Insulation
- 39. Metal Jacketing for Thermal Insulation

# ***8 Structural AMRs***

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1. Concrete Structures
2. Steel Primary Containment and Internals
3. Steel Structures in Seismic Category I Buildings, the Turbine Building, and Category I Yard Structures
4. Component Supports
5. Spent Fuel Pool Liner, Components, and Racks
6. Aluminum
7. Structural Sealants
8. Tornado Relief Vent Assemblies

# ***5 Electrical AMR Summaries***

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1. Phase Bussing
2. Nelson Frames
3. Electrical Splices, Connectors, and Terminal Blocks
4. Insulated Electrical Cable Outside Containment
5. Insulated Electrical Cable - Containment

# ***BWRVIP Reports***

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- BWRVIP-74 Reactor Pressure Vessel Inspections and Flaw Evaluation Guidelines
- BWRVIP-27 SLC/Core Plate delta-P Inspection and Flaw Evaluation Guidelines
- BWRVIP-38 Shroud Support Inspection and Flaw Evaluation Guidelines
- BWRVIP-41 Jet Pump Assembly Inspection and Flaw Evaluation Guidelines
- BWRVIP-48 Vessel ID Attachment Weld Inspection and Flaw Evaluation Guidelines
- BWRVIP-76 Core Shroud Inspection and Flaw Evaluation Guidelines
- BWRVIP-18 Core Spray Internals and Flaw Evaluation Guidelines
- BWRVIP-26 Top Guide Inspection and Flaw Evaluation Guidelines
- BWRVIP-47 Lower Plenum Inspection and Flaw Evaluation Guidelines

# Conclusion

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# ***Applicant's Environmental Report - Operating License Renewal Stage***

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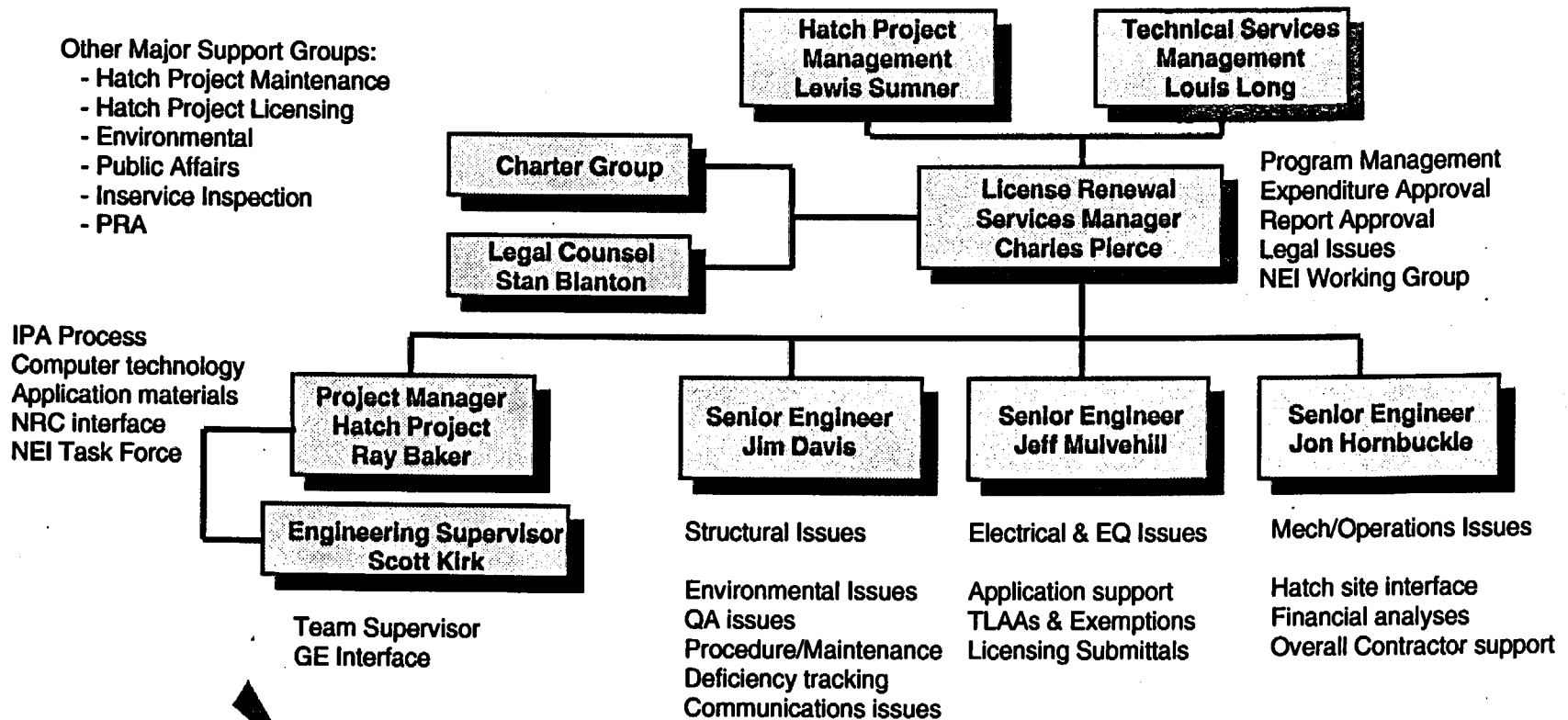
*February 10, 2000*

*Southern Nuclear Operation Company*



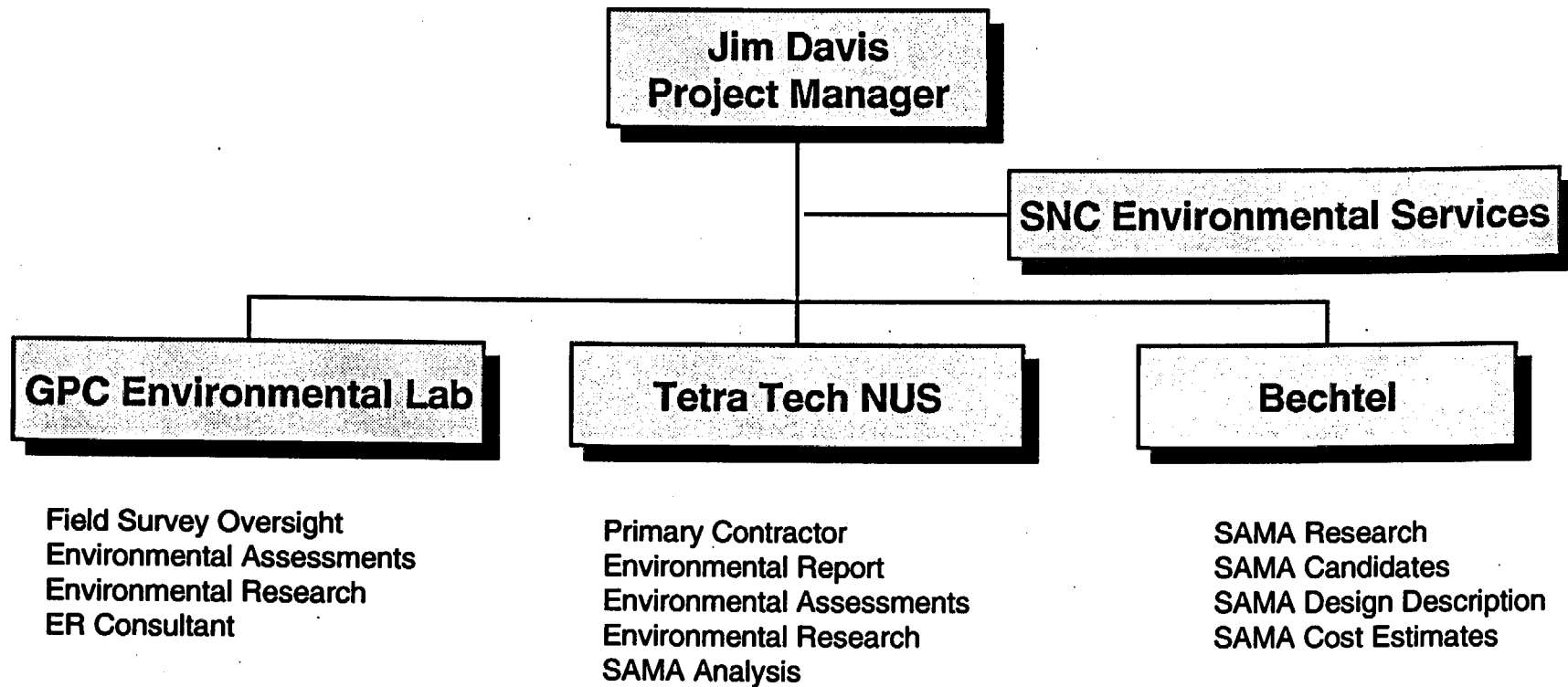
# Project Overview

## Our project organization -



# *Environmental Report*

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# ***Environmental Report***

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- ***Format of Environmental Report (ER)***
  - ***Format of the ER is similar to the Calvert Cliffs ER***
  - ***Section 1.0 - Introduction***
  - ***Section 2.0 - Proposed Action and Alternatives***
  - ***Section 3.0 - Environmental Consequences and Mitigating Actions***
  - ***Section 4.0 - Compliance Status***
  - ***Section 5.0 - References***

# ***Environmental Report***

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- ***General Description of the Site***

- ***Located in Appling County approximately 67 miles southwest of Savannah, Georgia***
- ***Site consists of 2240 acres***
- ***Closed loop cooling system***
- ***Population estimates within 80-km (50-mile radius) obtained using SECPOP90***

# ***Environmental Report***

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- ***Evaluation of the Category 2 Issues***
  - ***Twenty-one Category 2 issues identified by GEIS***
  - ***Five of the twenty-one requirements not applicable to HNP site***
    - ◆ ***Entrainment of fish and shellfish in early life stages (once-through cooling)***
    - ◆ ***Impingement of fish and shellfish (once-through cooling)***
    - ◆ ***Heat shock (once-through cooling)***
    - ◆ ***Groundwater use conflicts (Ranney wells)***
    - ◆ ***Groundwater quality degradation (cooling ponds)***
  
- ***Sixteen Category 2 issues and Environmental Justice addressed in ER***

# ***Environmental Report***

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- ***Surface Water Use***

- ***Altamaha river annual flow rate less than  $3.15 \times 10^{12}$  ft<sup>3</sup>/year***
- ***HNP withdraws annual avg. of ~ 57 MGD***
- ***HNP returns ~ 25 MGD***
- ***Consumptive loss 0.44 - 3.1 % of river flow***
- ***Impacts small***
- ***GADNR concurred***

# ***Environmental Report***

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- ***Groundwater Use***

- ***HNP pumps more than 100 gallons per minute***
- ***GADNR permit for four wells at 764 gpm***
- ***3 wells installed averaging ~ 126 gpm***
- ***Nearest appreciable demand is 10 miles south of site***
- ***Groundwater pump tests determined draw down would not extend to the facility boundary***

# ***Environmental Report***

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- ***Terrestrial Resources***

- ***SNC has no plans to perform major refurbishment activities***
- ***No impacts to terrestrial resources***

# ***Environmental Report***

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- ***Threatened and Endangered (T&E) Species***
  - ***No significant refurbishment activities required for license renewal***
  - ***USFWS & NMFS consulted for T&E Federally-listed species***
  - ***GADNR consulted for T&E State-listed species***
  - ***Environmental field survey performed on the plant site and transmission corridors***
  - ***Mussel survey performed in Altamaha***

# Environmental Report

## • Threatened and Endangered (T&E) Species

Table 3-2. Listed<sup>1</sup> species known to occur in the vicinity of HNP or in associated rights-of-way.

| Common Name           | Scientific Name                   | Federal Status   | State Status | Source           |
|-----------------------|-----------------------------------|------------------|--------------|------------------|
| Shortnose sturgeon    | <i>Acipenser brevirostrum</i>     | Endangered       | Endangered   | Reference 5      |
| Eastern indigo snake  | <i>Drymarchon corais couperi</i>  | Threatened       | Threatened   | Reference 55     |
| Gopher tortoise       | <i>Gopherus polyphemus</i>        | —                | Threatened   | References 5, 55 |
| American alligator    | <i>Alligator mississippiensis</i> | Threatened (S/A) | —            | References 3, 55 |
| Bald eagle            | <i>Haliaeetus leucocephalus</i>   | Threatened       | Endangered   | (a)              |
| Wood stork            | <i>Mycteria americana</i>         | Endangered       | Endangered   | Reference 55     |
| Bachman's sparrow     | <i>Aimophila aestivalis</i>       | —                | Rare         | Reference 55     |
| Purple honeycomb head | <i>Baldwinia atropurpurea</i>     | —                | Rare         | Reference 65     |
| Cutleaf beardtongue   | <i>Penstemon dissectus</i>        | —                | Threatened   | Reference 65     |
| Parrot pitcher plant  | <i>Sarracenia psittacina</i>      | —                | Threatened   | Reference 65     |
| Sandhill golden-aster | <i>Pityopsis pinifolia</i>        | —                | Threatened   | (b)              |
| Hairy rattleweed      | <i>Baptisia arachnifera</i>       | —                | Endangered   | (b)              |

a. Observed by Georgia Power Company biologists.

b. GNHP

1. Species that USFWS in NMFS has listed or proposed for listing as threatened or endangered; species that GADNR has listed or proposed for listing as rare, threatened, or endangered.



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# ***Environmental Report***

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- ***Air Quality***

- ***HNP located in counties classified as attainment for all criteria pollutants***
- ***Nearest nonattainment area is 140 miles northwest of HNP***
- ***SNC has no plans to perform major refurbishment activities***
- ***No impact to air quality***



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# ***Environmental Report***

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- ***Microbiological (Thermophilic) Organisms***
  - *HNP discharges in a river with annual flow rate less than  $3.15 \times 10^{12}$  ft<sup>3</sup>/year*
  - *GADNR EPD consulted, no known presence in Altamaha*
  - *HNP discharge would not promote growth*
  - *No impact to public health*
- ***Electrical Shock***
  - *Description of transmission lines (500 kV and 230 kV lines)*
  - *500 kV and 230 kV lines evaluated per NESC for ground clearance*
  - *Both under NESC 5 mA requirement (ENVIRO)*

# ***Environmental Report***

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- ***Housing Impacts***
- ***Public Services, Education***
- ***Public Services, Utilities***
- ***Public Services, Transportation***
  - ***SNC has no plans to perform major refurbishment activities***
  - ***SNC strategic plan does not anticipate an increase workers***
  - ***SNC assumed 60 additional workers for the renewal term for bounding analysis***
  - ***bounding analysis show no socioeconomic impacts***

# ***Environmental Report***

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- ***Offsite Land Use, Refurbishment***
- ***Offsite Land Use, License Renewal Term***
  - ***SNC has no plans to perform major refurbishment activities***
  - ***SNC assumed 60 additional workers for the renewal term for bounding analysis***
  - ***Population-related impacts - small***
  - ***Tax-revenue impacts***
    - ◆ ***Currently ~ 70% of Appling County tax base***
    - ◆ ***No increase anticipated since no refurbishment improvements planned***

# ***Environmental Report***

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- ***Historic and Archaeological Resources***
  - ***HNP has no historic or archaeological properties within a 10 mile radius***
  - ***No major construction planned for license renewal period***
  - ***GADNR Historic Preservation Division concurs***

# ***Environmental Report***

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- ***Severe Accident Mitigation Analysis (SAMA)***
  - ***Methodology based on “Regulatory Analysis Technical Evaluation Handbook”, NUREG/BR-0184, January 1997***
  - ***Developed a bounding analysis that reduced risk to “0”***
  - ***Analysis demonstrated that any modification greater than \$500,000 are not cost justified***
  - ***Onsite costs and replacement power were included in analysis***

# ***Environmental Report***

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## ***Severe Accident Mitigation Analysis (SAMA)***

- ***Candidate Screening Process***
  - ***Initial list of 115 SAMA candidates***
  - ***16 were already in place at HNP***
  - ***46 were not applicable or risk significant to BWR design***
  - ***10 were combined with other similar modifications***
  - ***43 unique SAMA candidates with potential value remained***
  - ***Preliminary cost estimates were developed for 43***
  - ***These were screened to \$500,000***
  - ***16 remained for more detailed analysis***



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# ***Environmental Report***

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## ***Severe Accident Mitigation Analysis (SAMA)***

- ***16 Remaining SAMA Candidates***
  - ***A more detailed conceptual design and cost analysis was developed***
  - ***Level II analysis determined 5 SAMAs were currently adequately covered by plant design and procedures***
  - ***One SAMA was found to be greater than \$500,000***
  - ***The remaining ten were analyzed***
  - ***Greatest single SAMA benefit was ~ \$2500 with a cost of \$100,000 (per unit)***
  - ***None of the SAMAs analyzed were cost justified***



# ***Environmental Report***

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- ***New and Significant Information***

- ***Reviewed Category 1 issues to verify that GEIS conclusions remained valid for HNP***
- ***Met with State and Federal regulatory agencies for input***
- ***Performed environmental survey for T&E species***
- ***Performed mussel survey in Altamaha River***
- ***Environmental Report received environmental, legal and peer reviews***
- ***Process and procedures in place governed by Environmental Protection Plan to assure new & significant information is adequately addressed.***

# ***Environmental Report***

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- ***Environmental Justice Review***
  - ***SNC followed guidance in NRR Procedure for Environmental Justice Reviews***
  - ***Evaluation of the Category 2 issues identified no significant environmental impacts***
  - ***Therefore there are no disproportional high and/or adverse impacts on any member of the public***

# ***Environmental Report***

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- ***Alternatives***

- ***Feasible Alternatives***

- ◆ ***coal-fired generation***
    - ◆ ***gas fired generation***
    - ◆ ***imported power***

- ***Other Alternatives addressed as not feasible***

- ◆ ***wind***
    - ◆ ***solar***
    - ◆ ***hydropower***
    - ◆ ***geothermal***
    - ◆ ***wood energy***
    - ◆ ***municipal solid waste***
    - ◆ ***other biomass-derived fuels***
    - ◆ ***oil***
    - ◆ ***nuclear power***
    - ◆ ***delayed retirement***
    - ◆ ***conservation***

# ***Environmental Report***

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- ***Comparison HNP with Alternatives***
  - ***1690 MWe Plant Hatch generation***
  - ***1800 MWe Coal-fired generation***
  - ***1760 MWe Gas-fired combined-cycle generation***
  - ***1690 MWe Replacement power***
  
- ***Comparison of potential environmental impacts***
  - ***Land Use***
  - ***Ecology***
  - ***Aesthetics***
  - ***Water Quality***
  - ***Air Quality***
  - ***Solid Waste***
  - ***Human Health***
  - ***Socioeconomics***
  - ***Culture***

# ***Environmental Report***

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- ***Unavoidable Adverse Impacts***
  - ***No significant adverse impacts associated with the continued operation of HNP were identified***
  - ***No significant refurbishment activities necessary to support continued operation of HNP***
  
- ***Irreversible or Irretrievable Resource Commitments***
  - ***Spent Fuel Assemblies***
  
- ***Short-Term Versus Long-Term Productivity***
  - ***Incremental but small effect on long term air, water and land conditions***
  - ***No long term adverse effects were identified***
  - ***GPC environmental stewardship will enhance productivity***

# ***Environmental Report***

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- ***Status of Compliance***
  - ***List of HNP permits and compliance status***
  - ***SNC personnel responsible for monitoring and ensuring compliance with permits***
  - ***SNC has measures in place to ensure environmentally sensitive areas or species of concern are adequately protected***

# ***Environmental Report***

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## **• Conclusions**

- Environmental impacts from HNP license renewal are small***
- No unique plant characteristics identified that could affect the environment***
- Federally-listed or State-listed T&E species present on-site or transmission line ROWs will not be impacted***
- No significant historic or archaeological properties located on-site or transmission line ROWs identified***
- No environmental justice issues identified***
- Alternative generation impacts will be greater than license renewal***