



UNITED STATES  
NUCLEAR REGULATORY COMMISSION

WASHINGTON, D.C. 20555-0001  
June 16, 2000

LICENSEE: Duke Energy Corporation

FACILITY: Oconee Nuclear Station, Units 1, 2, and 3

SUBJECT: OCONEE NUCLEAR STATION, UNITS 1, 2, and 3 RE: MEETING SUMMARY  
ON CONTROL ROOM HABITABILITY ISSUES (TAC NOS. MA8942, MA8943,  
AND MA8944)

On June 9, 2000, the NRC met at the NRC headquarters in Rockville, Maryland, with representatives of the Duke Energy Corporation (Duke) to discuss various issues related to control room habitability at the Oconee Nuclear Station, Units 1, 2, and 3. Enclosure 1 is a list of the individuals who attended the meeting and Enclosure 2 is the handout material that was supplied by Duke.

The purpose of the meeting was to discuss the current status of the Oconee control room habitability issues and develop an understanding of the process and schedule for incorporating the alternate source term into Oconee's licensing basis. Topics discussed included the open items that have been generated by the NRC and Oconee's plan for their disposition. In addition, accomplishments such as tracer gas testing, sealing of ductwork, procedure upgrades, operability evaluation, new design calculations, and studies and evaluations that have been or are being performed were discussed. Also, the licensing history and Oconee's ongoing plans for design basis and plant modifications was discussed.

It was decided that another meeting would be held in August 2000 to discuss the details of Oconee's technical analysis, methodology, and dose calculations that will be used to resolve the control room habitability design basis issues. This work by Duke and the discussion will help Oconee evaluate which modifications will yield the most safety margin. Following the meeting, Oconee will decide on the modifications by late September and submit proposed changes to the Technical Specification and Final Safety Analysis Report in early 2001. Implementation of the modifications will follow staff approval of the proposed changes.

David E. LaBarge, Senior Project Manager, Section 1  
Project Directorate II  
Division of Licensing Project Management  
Office of Nuclear Reactor Regulation

Docket Nos. 50-269, 50-270, and 50-287

Enclosures: 1. Attendance List  
2. Duke Handout

cc w/encls: See next page

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/RA/

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Meeting Summary dated June 16, 2000

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Oconee Nuclear Station

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Meeting Summary on Control Room Habitability Issues

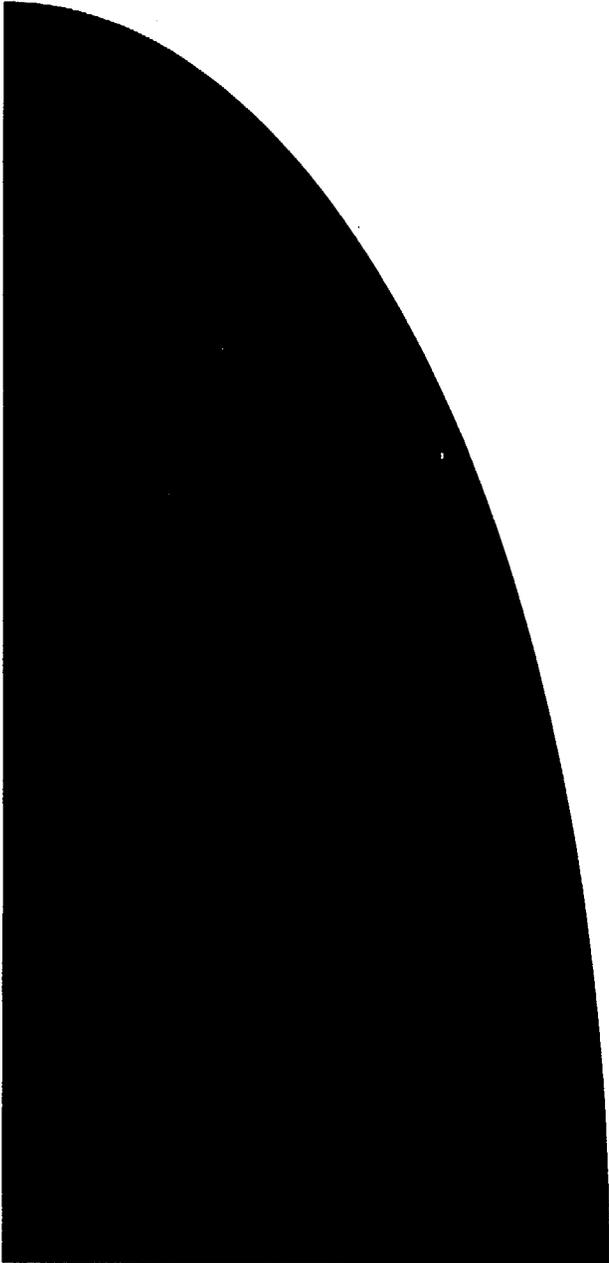
Attendance List

Name	Affiliation
D. LaBarge	NRC/NRR/DLPM/PDII-1
R. Schin	NRC/RII/DRS/EB
J. Lee	NRC/NRR/DSSA/SPSB
L. Brown	NRC/NRR/DSSA/SPSB
L. Nicholson	Duke/Oconee/Reg. Compliance Mgr.
R. Burley	Duke/Oconee/Engineering
S. P. Schultz	Duke/Ge. Office/Radiological Engr. Mgr.
L. J. Azzarello	Duke/Oconee/Engineering Design Basis Mgr.
P. R. Wilson	NRC/NRR/DSSA/SPSB
J. H. Raval	NRC/NRR/DSSA/SPLB
H. Walker	NRC/NRR/DSSA/SPLB
J. Segala	NRC/NRR/DSSA/SPLB
H. Berkow	NRC/NRR/PDII

# Control Room Habitability

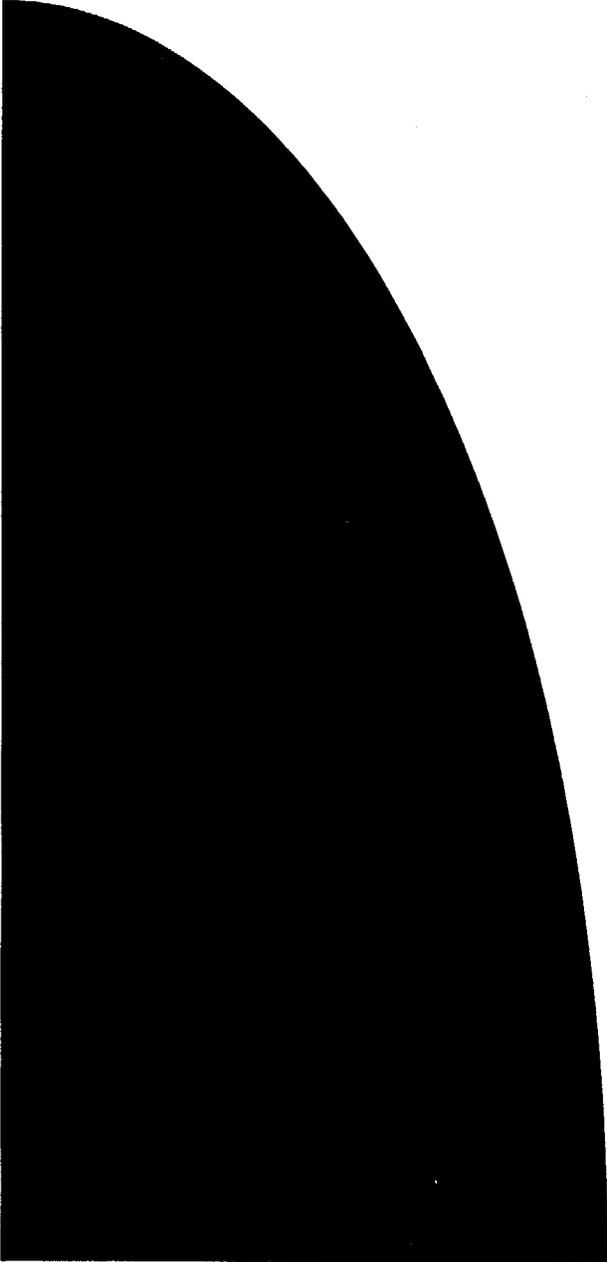
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Oconee Nuclear Station  
Meeting with NRC  
June 9, 2000



# Purpose of Meeting

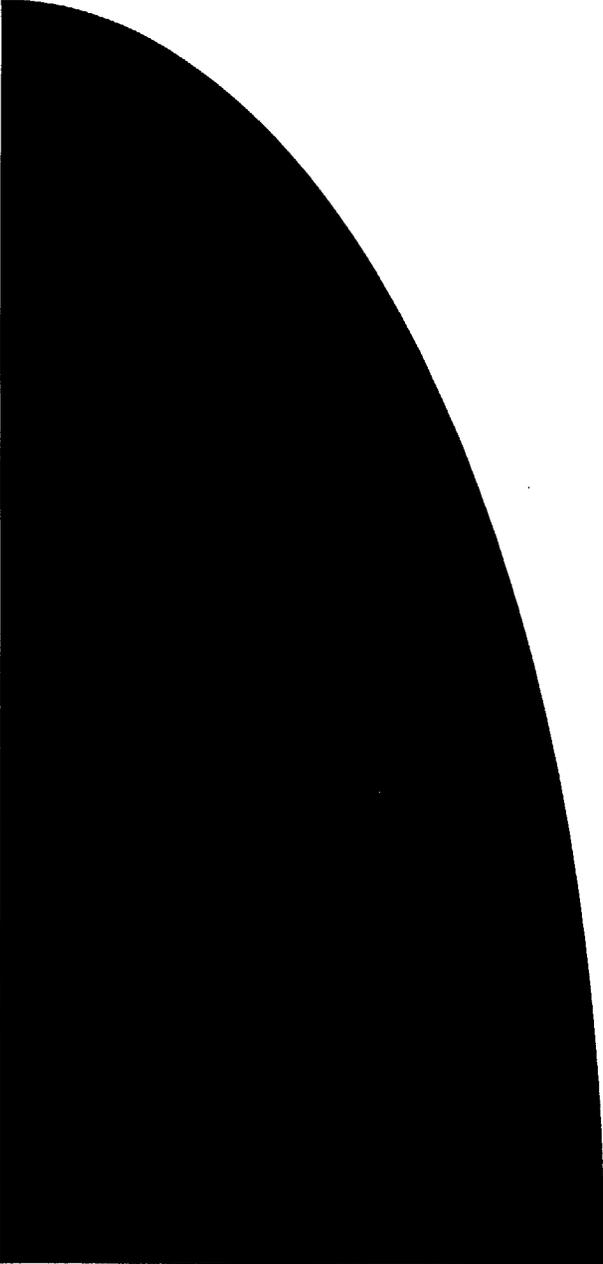
- Inform NRC of current status of control room habitability issues at Oconee
- Develop understanding of the process for incorporating alternate source term into Oconee's licensing basis



# Proposed Agenda

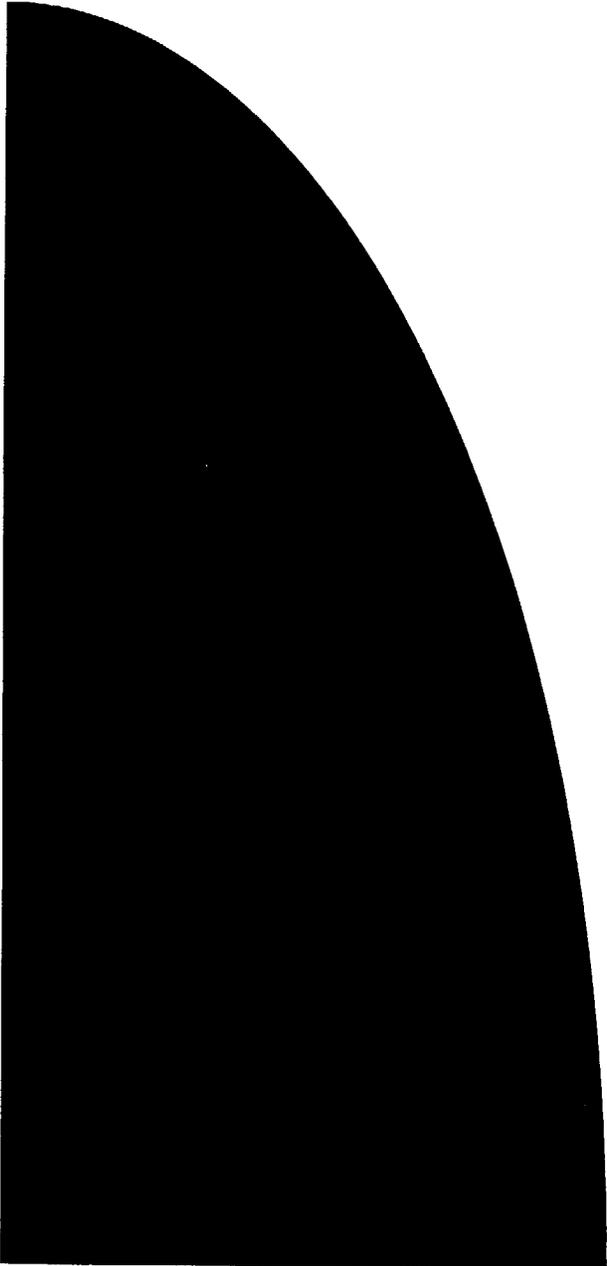
- NRC Open Items and Disposition
- Accomplishments / Current Status
- Licensing History
- Where Oconee is Going
- Wrap-Up

Note: There are no new regulatory commitments in this presentation



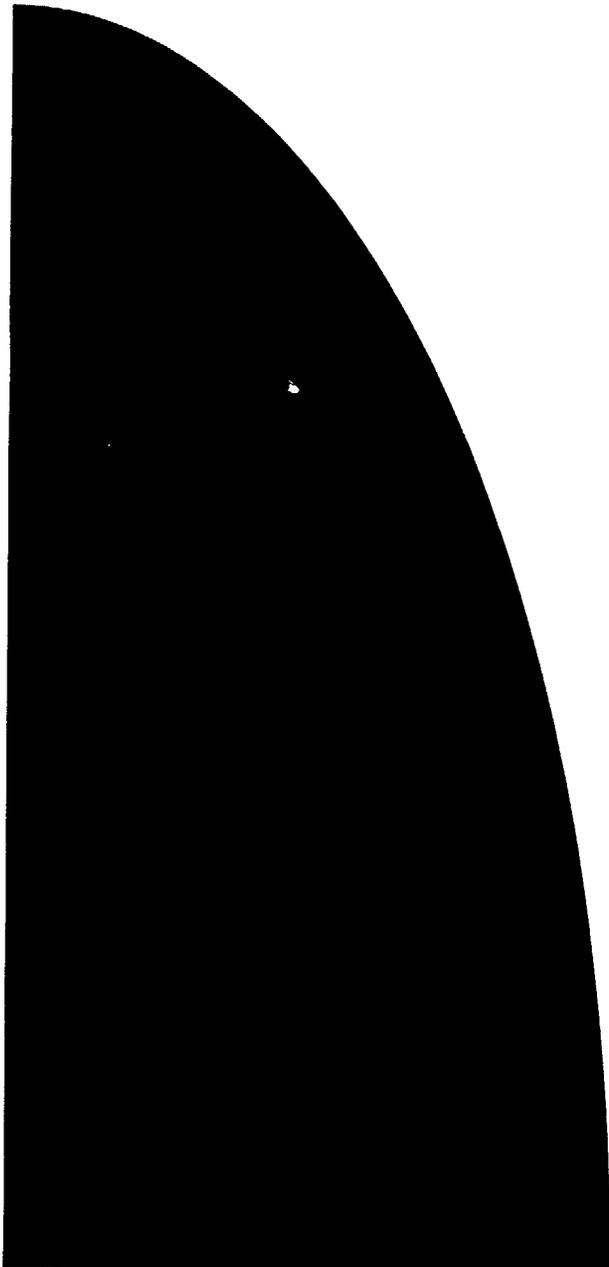
# NRC Open Items

- Potential unfiltered inleakage due to control room pressure  $< 1/8$  in.
- Potential unfiltered inleakage due to single failures
- Operator dose limits
- Technical Specifications
- Safety and quality classification



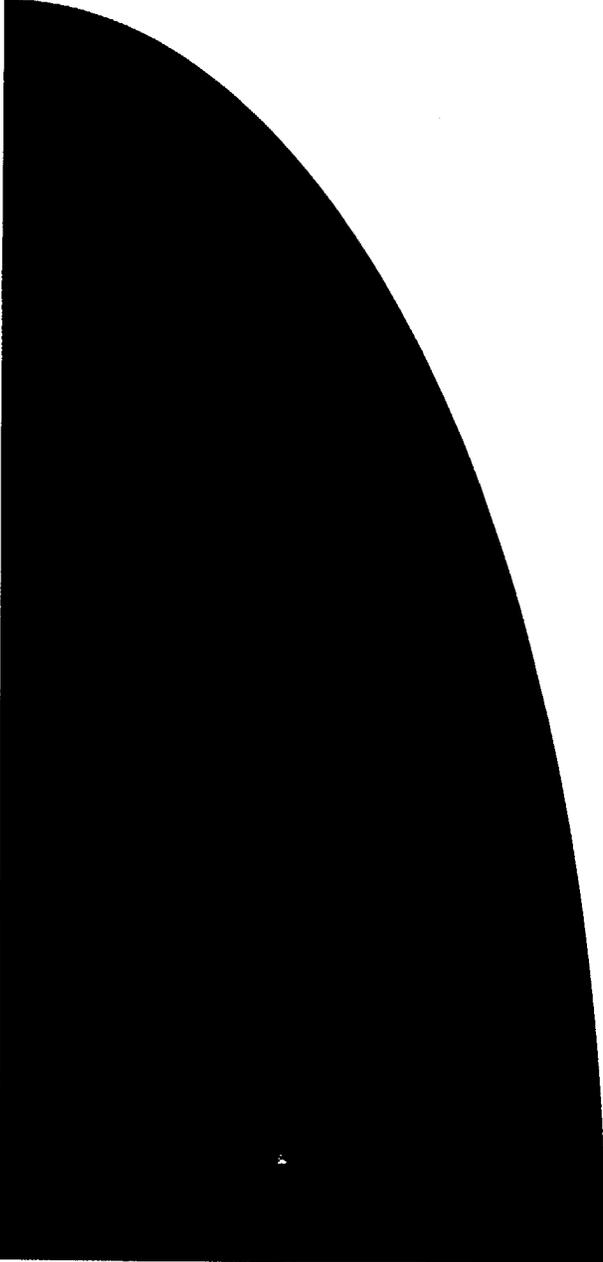
# NRC Open Item #1, Proposed Disposition

- Potential for unfiltered inleakage due to control room pressure less than 1/8 inch with booster fans on
- Oconee has performed tracer gas testing to determine potential for unfiltered inleakage
- Results incorporated into our operability and design dose calculations



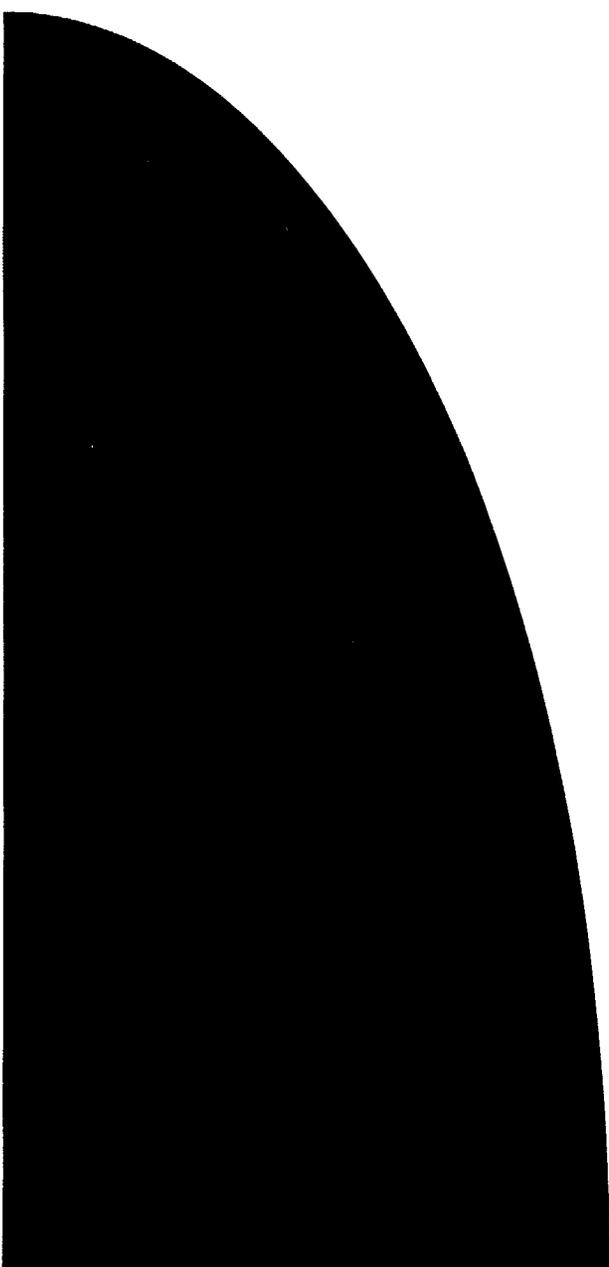
# NRC Open Item #2, Proposed Disposition

- Potential for unfiltered inleakage due to single failures
- Licensing basis does not require single failure for pressurization
- Oconee performed tracer gas testing with only one booster fan
- Single failure calculation underway
- Oconee will review results and determine disposition of findings



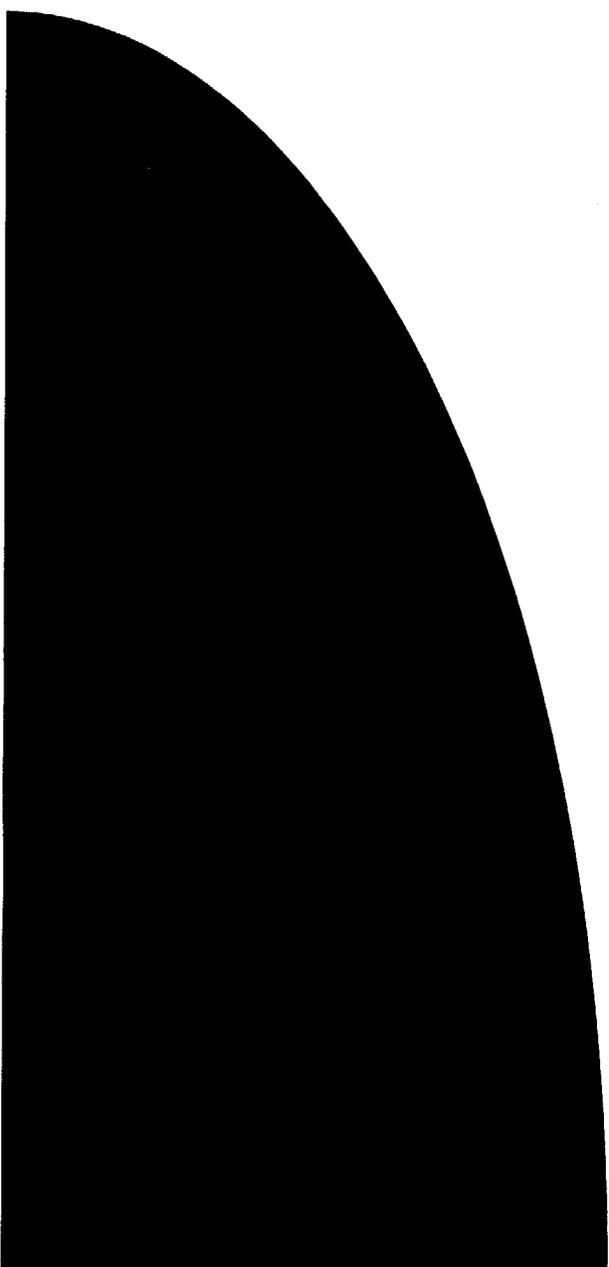
# NRC Open Item #3, Proposed Disposition

- Operator dose limits, per Oconee's licensing basis, is 10CFR20 limit of 50 rem thyroid
- GDC 19, with reference to Standard Review Plan 6.4, only allows 30 rem thyroid
- Use of alternate source term would supercede these with new limit of 5 rem TEDE



# NRC Open Item #4, Proposed Disposition

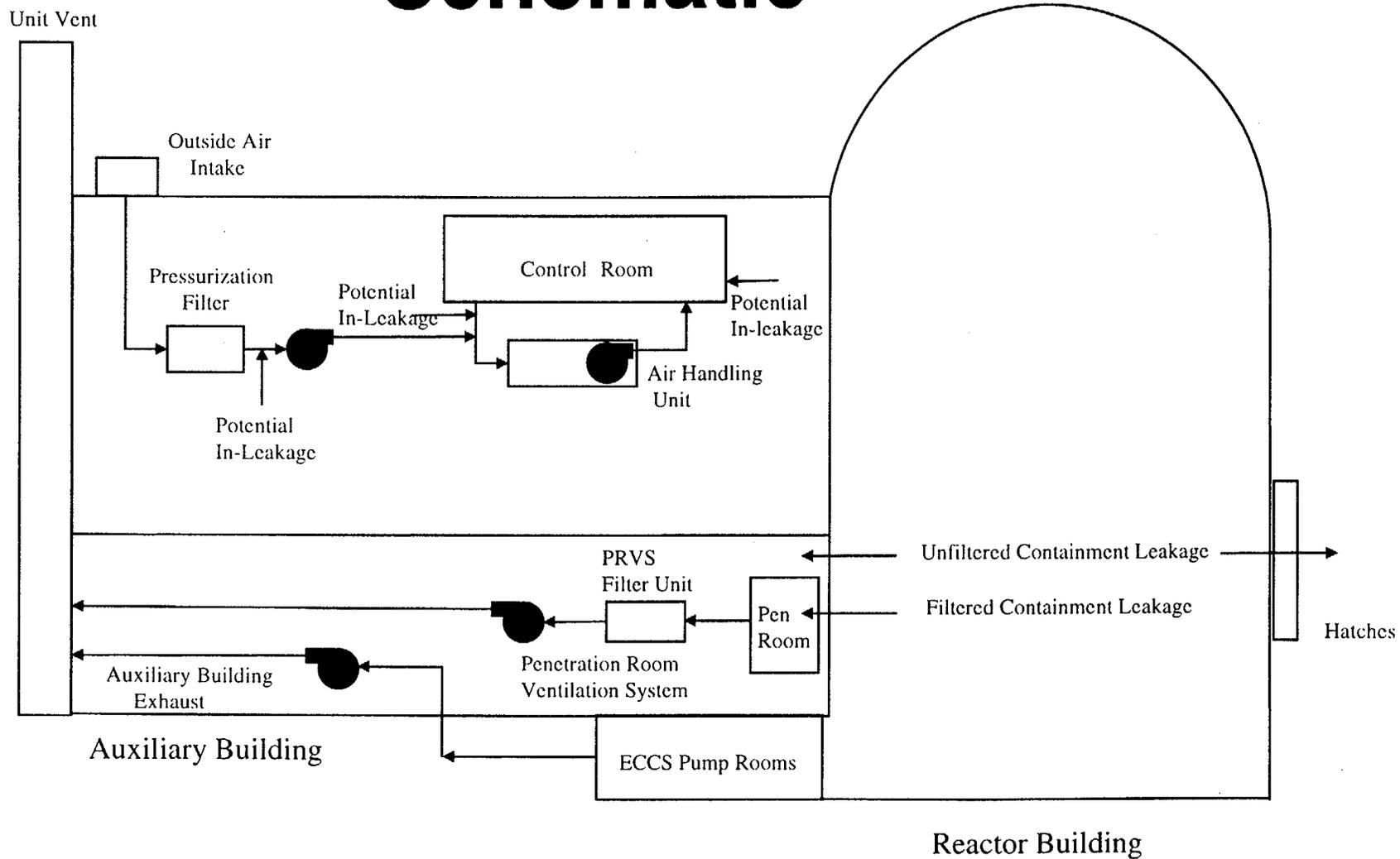
- Oconee Tech Specs require positive pressure with both booster fans running
- June '89 SER on CRVS Tech Spec
- Oconee not required to meet Standard Review Plan section 6.4
- Developing Tech Spec change which focuses on unfiltered inleakage versus positive pressure

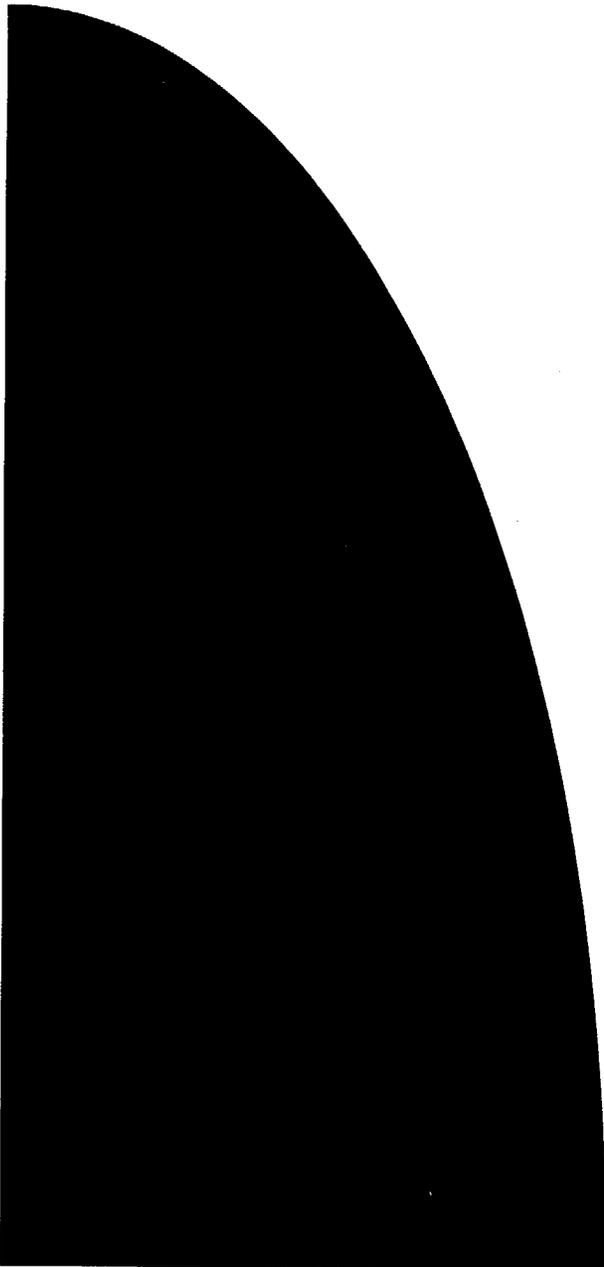


# NRC Open Item #5, Proposed Disposition

- CRVS was designed and installed non-safety, non-QA
- Systems and equipment that are QA are described in Oconee's UFSAR, Section 3.1
- Scope of what is QA-1 at Oconee was confirmed via 1995 SER
- CRVS equipment being placed in QA-5 program and SQUG program

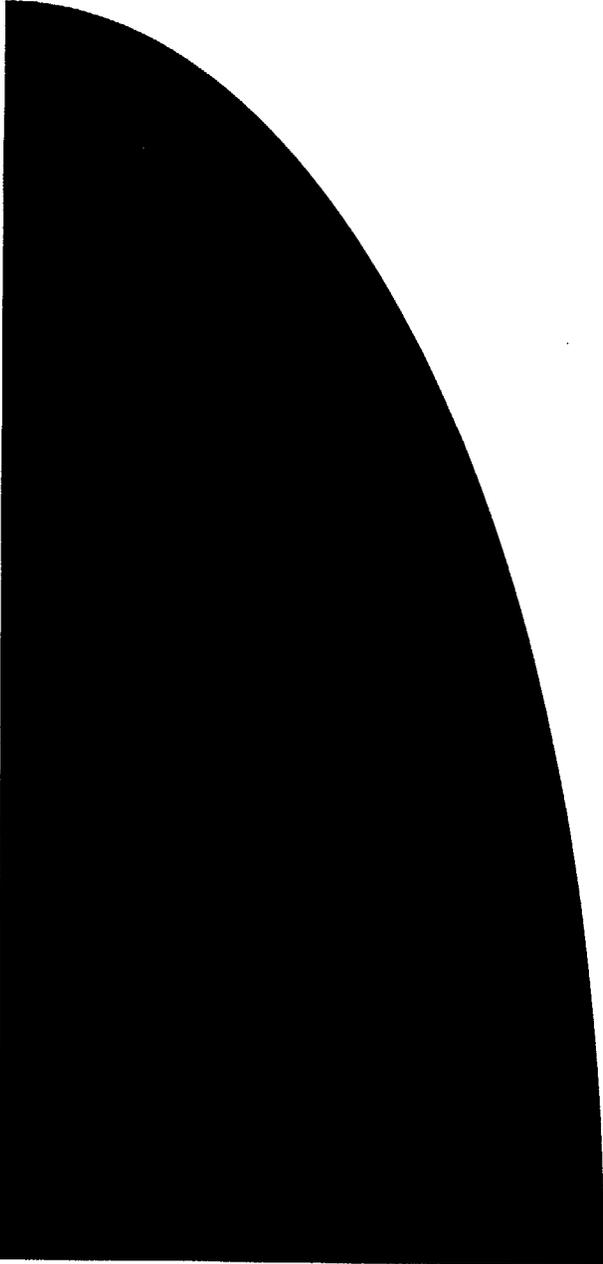
# Ventilation System Schematic





# Accomplishments / Current Status

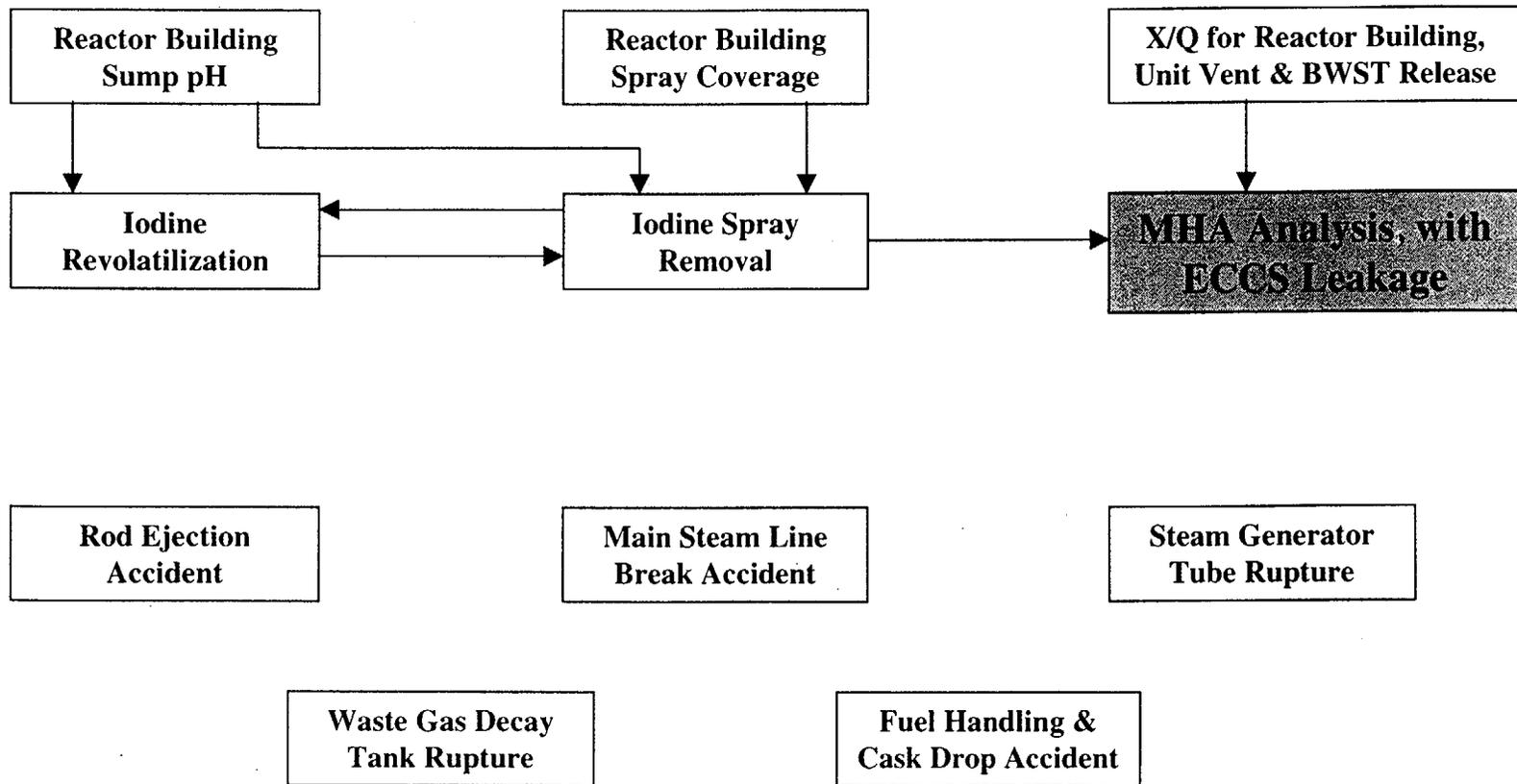
- Sealed up control room ductwork
- Performed tracer gas testing, with acceptable results
- Revised acceptance criteria in test procedures for positive pressure
- Upgraded testing and maintenance procedures to QA-1

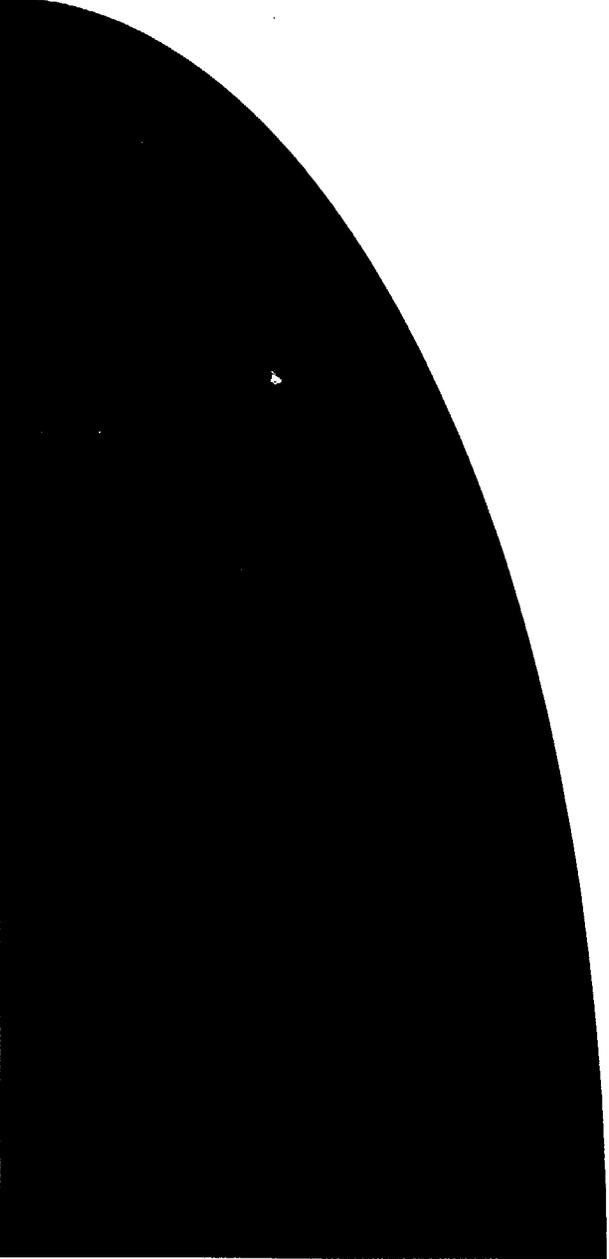


# Accomplishments / Current Status

- Performed operability calculation, following guidance of GL 91-18, on control room operator dose
- Involved with NEI task forces on control room habitability and alternate source term
- Creating all new design calculations, based on alternate source term

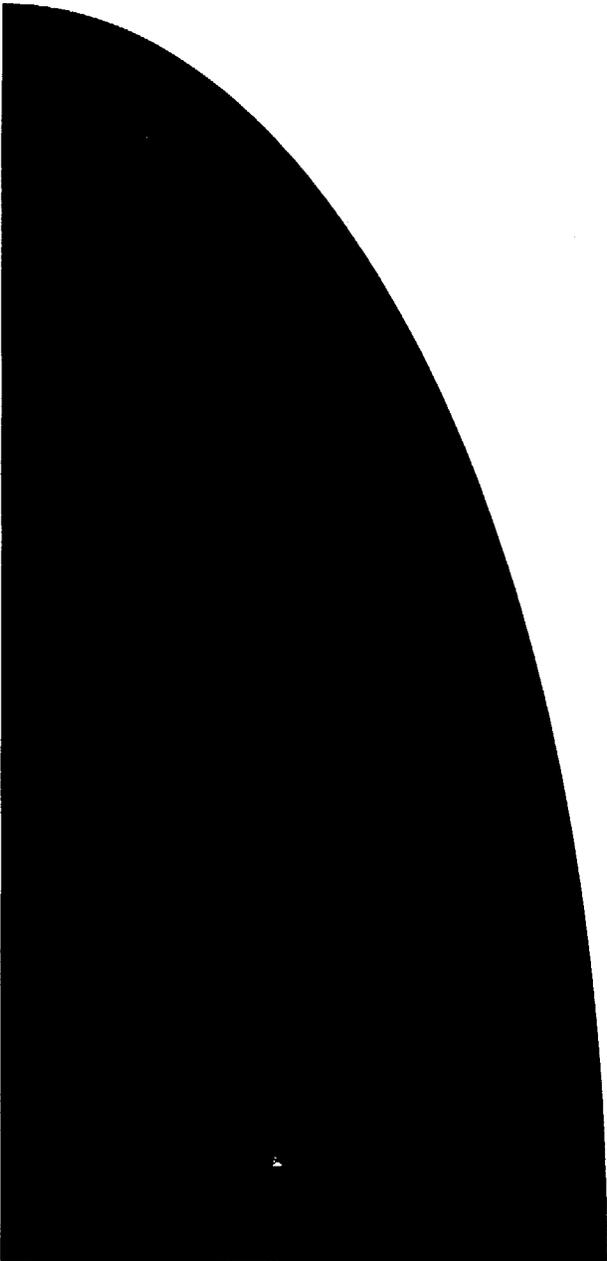
# Flow Chart of Dose Calculations





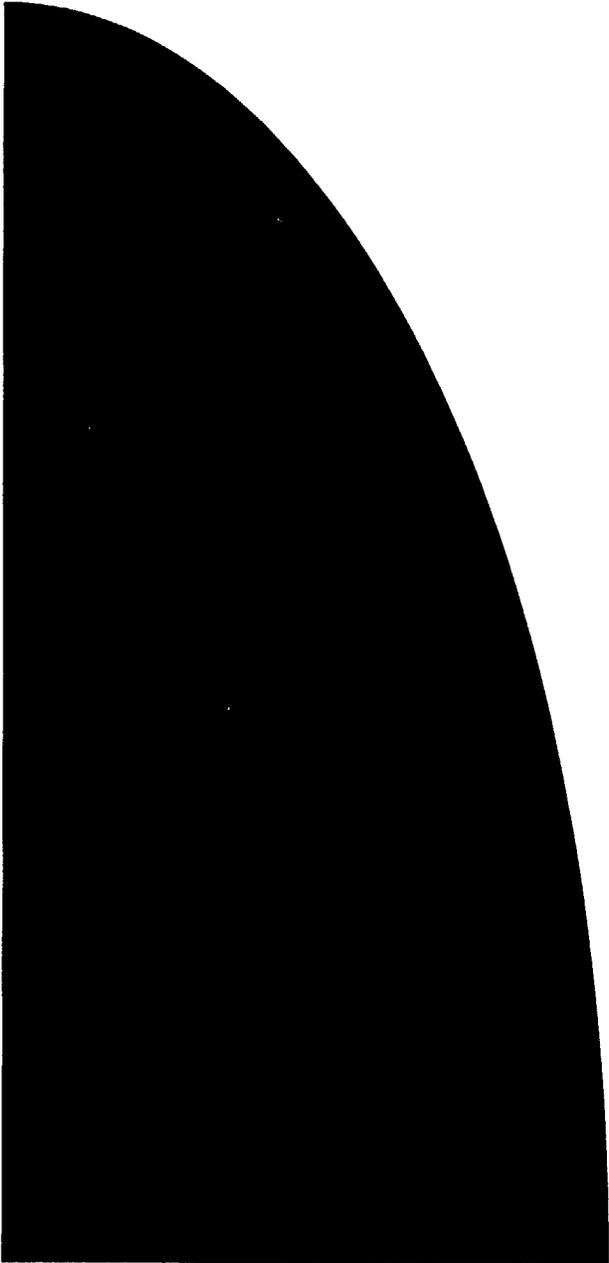
# Accomplishments / Current Status

- Design study to investigate feasibility, cost of various modification options
- Using new design calculations to evaluate dose reduction associated with modification options
- Study also evaluating potential equipment reliability improvements



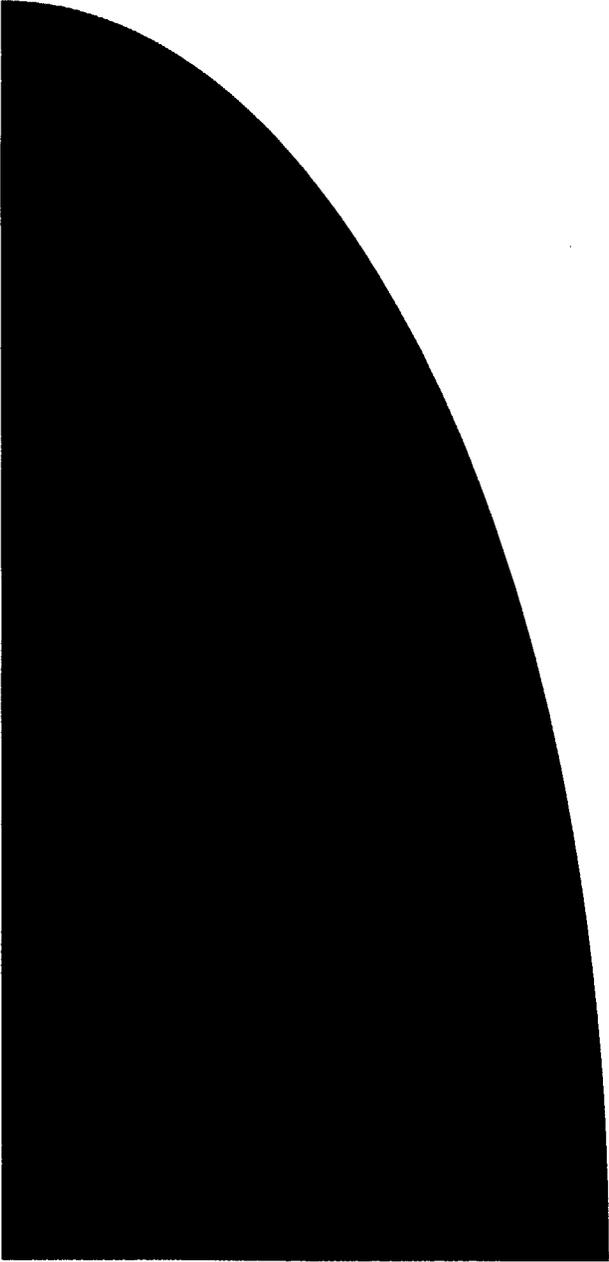
# Licensing Basis and History

- Original design of control room ventilation system consisted of a cooling and recirculating ventilation portion (cooling fans) and an outside intake and filtration portion (booster fans)
- Cooling fans are always running
- Booster fans started in the event of an accident



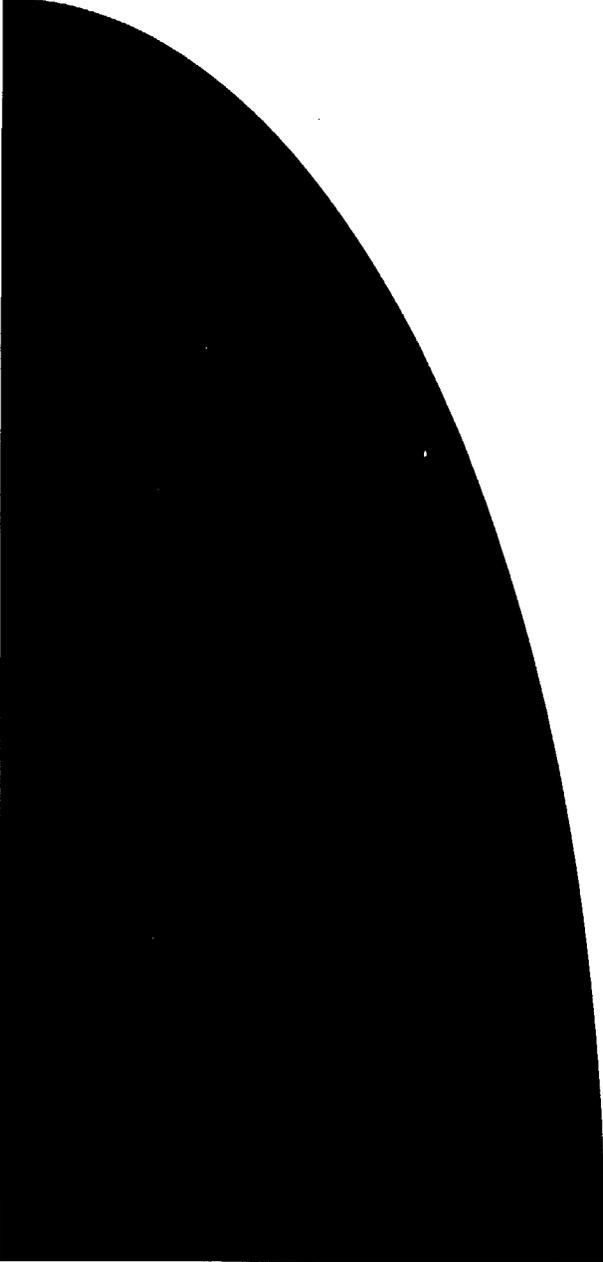
# Licensing Basis and History

- Oconee's original FSAR contains brief description of CRVS
- Indicates that cooling & filtration portion is single failure proof
- Does *NOT* address single failure requirements from a pressurization standpoint
- Original Tech Spec only applicable to filtration, not pressurization



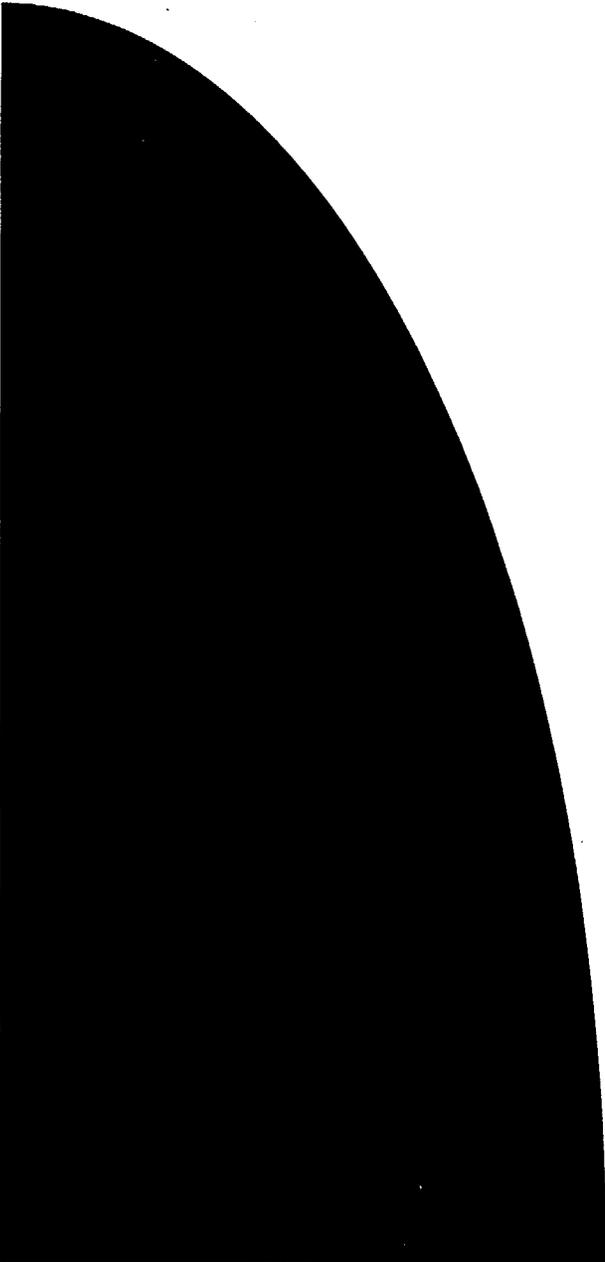
# Licensing Basis and History

- After TMI-2 event in 1979, NRC-issued NUREG 0578
- Duke responded that review was underway
- Duke committed to implement appropriate changes based on the results of this review



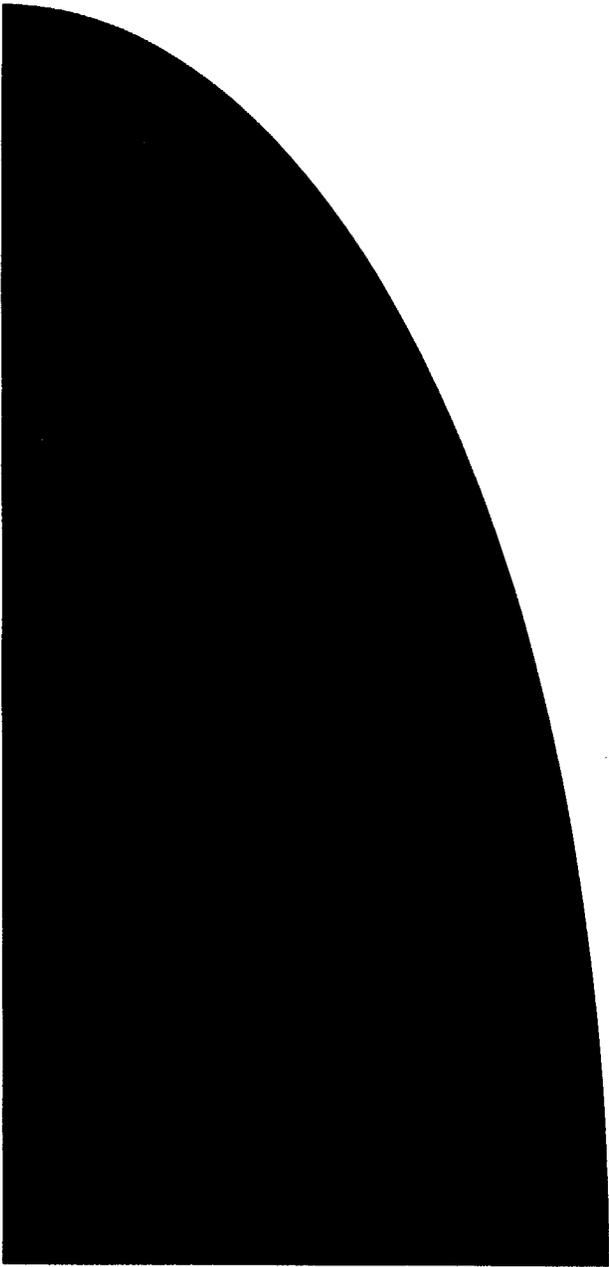
# Licensing Basis and History

- As a result of this review, Duke determined, using conservative assumptions per Standard Review Plan 6.4, that GDC 19 thyroid dose limits would be exceeded.
- Noted that, under “more realistic assumptions,” GDC 19 limits would NOT be exceeded.



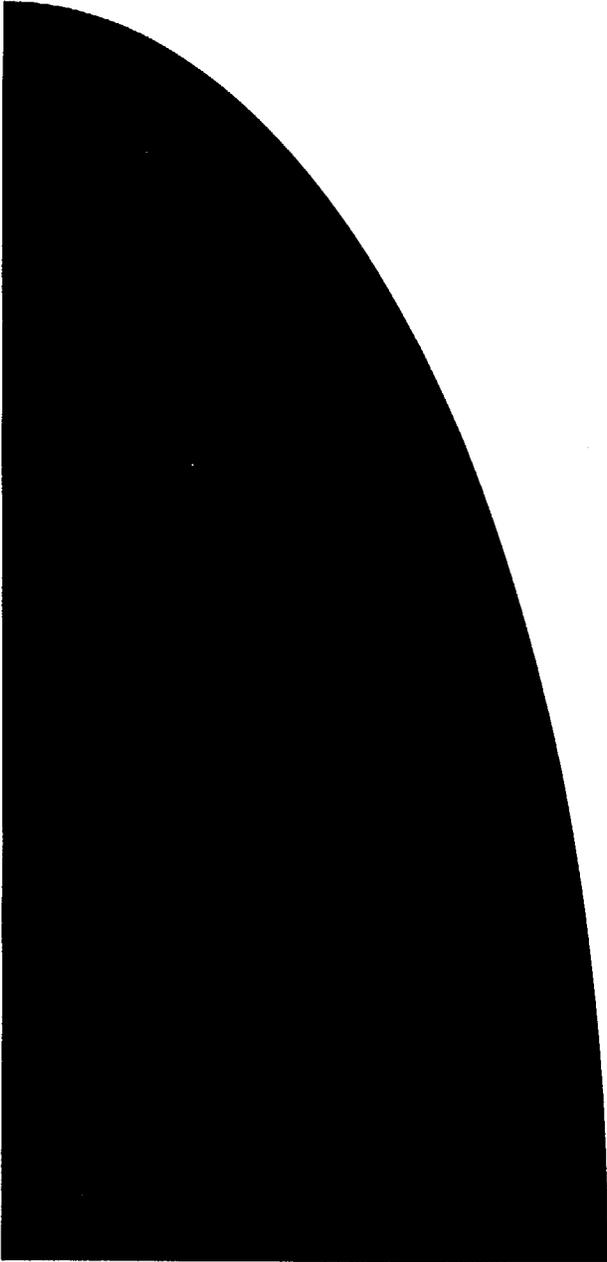
# Licensing Basis and History

- November 1980, NRC issues NUREG 0737, Item III.D.3.4
- Recognized that licensees fell into three categories of conformance
  - ◆ licensed to both GDC-19, SRP 6.4
  - ◆ licensed to GDC-19, not to SRP6.4
  - ◆ licensed to neither GDC-19 nor SRP 6.4
- Oconee falls into third category



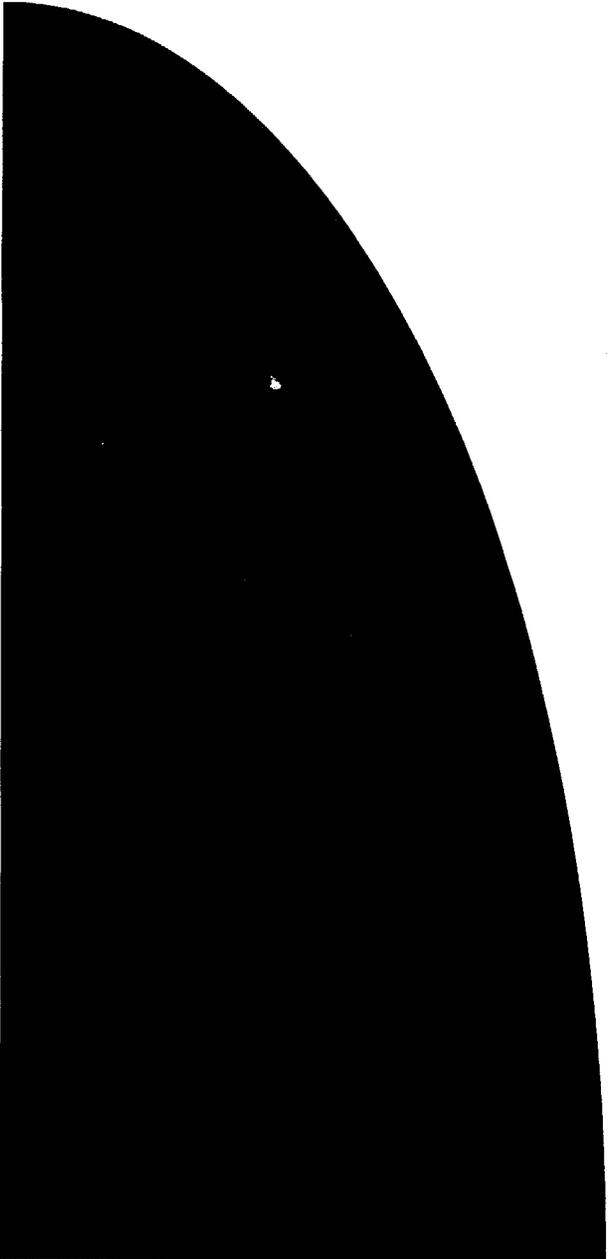
# Licensing Basis and History

- January 1981 Duke response to NUREG-0737
- NRC RAI, with subsequent Duke response
- November 1982 Duke report to NRC on status of modifications



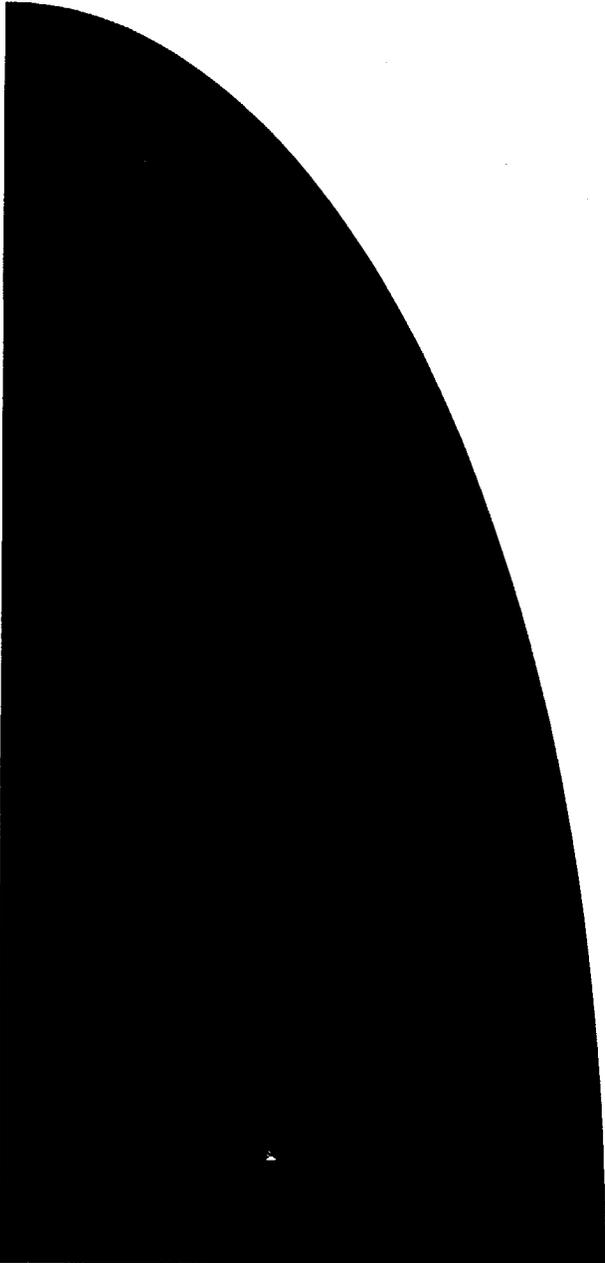
# Licensing Basis and History

- March 1983, NRC issues order regarding NUREG-0737 activities
- Late 1983, in response to ongoing pressurization concerns, Duke agreed to perform further sealing of control rooms by March 1984.
- Also agreed to perform design review of fan, damper capacity to enhance pressurization ability



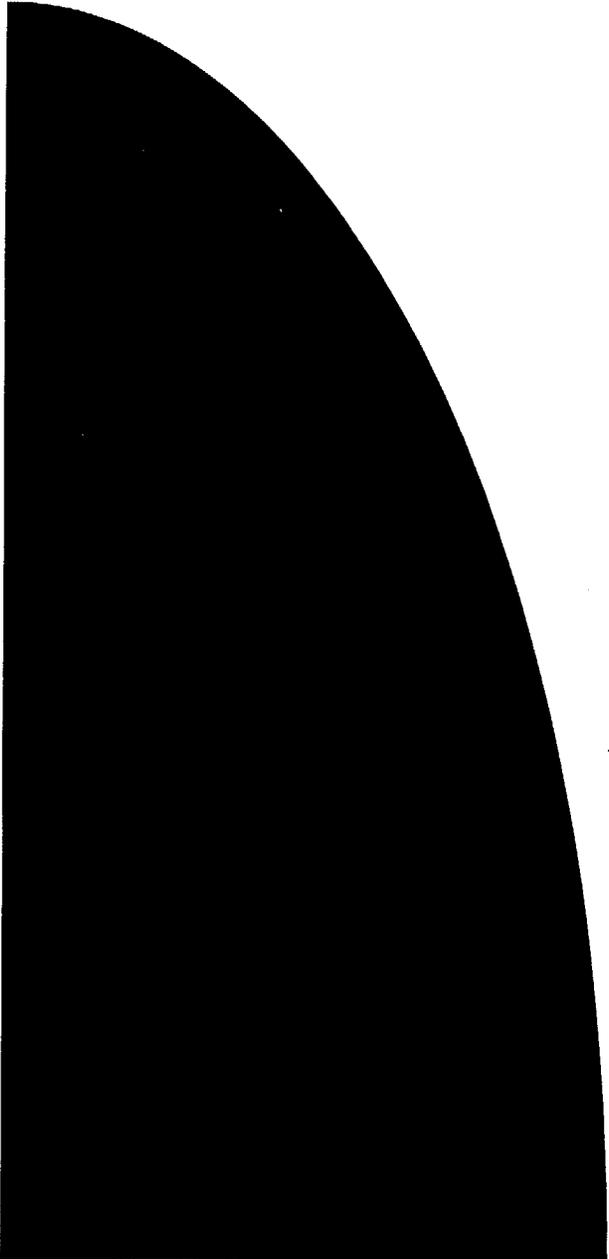
# Licensing Basis and History

- GL 83-37 issued in late 1983
- Required licensees to submit Tech Specs to cover systems addressed by NUREG-0737



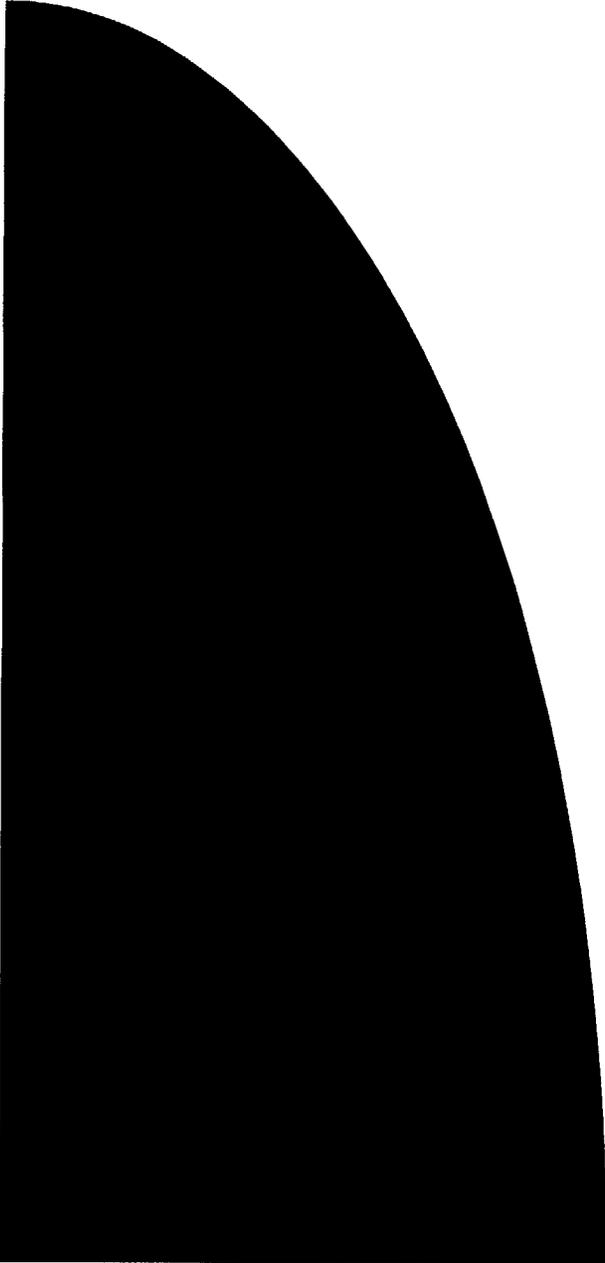
# Licensing Basis and History

- Additional NRC RAIs, Duke responses, and several meetings occurred during 1984, 1985
- This set of correspondence and meetings are on the docket and summarized in Duke's March 30, 1998 submittal to NRC on CRVS engineering inspection open items



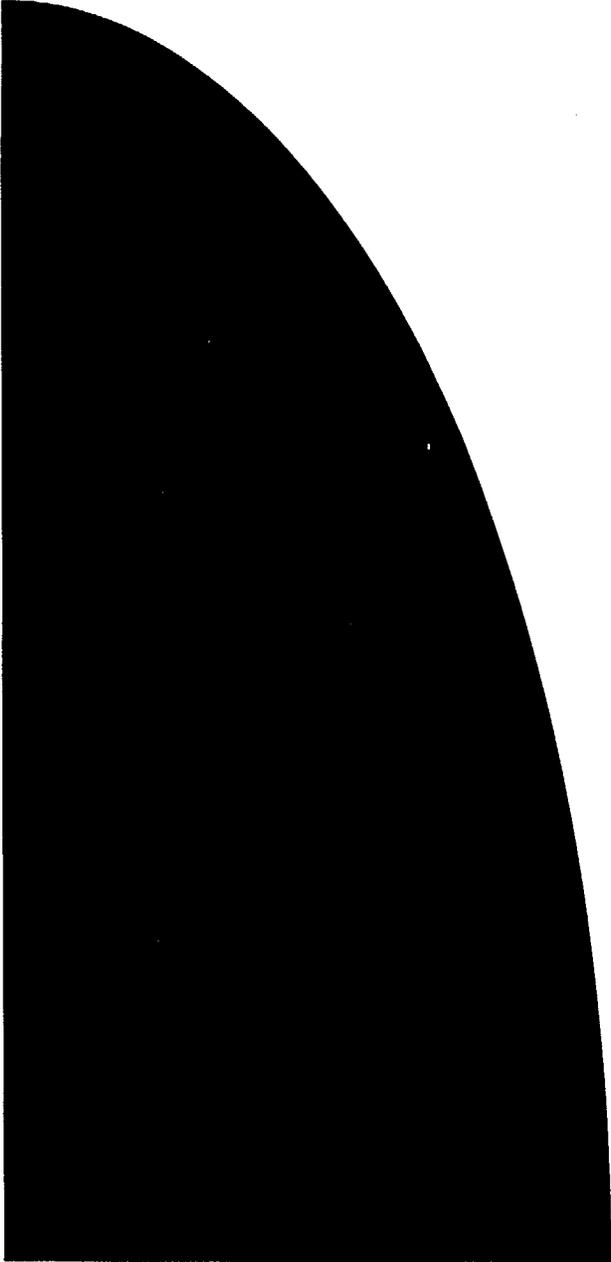
# Licensing Basis and History

- NRC issued SER on Oconee's CRVS in November 1986
  - ◆ concluded there was insufficient margin to assure that there would be no unfiltered infiltration
  - ◆ concluded that the control room intakes should be relocated to reduce doses to the control room
  - ◆ deferred review of thyroid dose analysis pending new source term



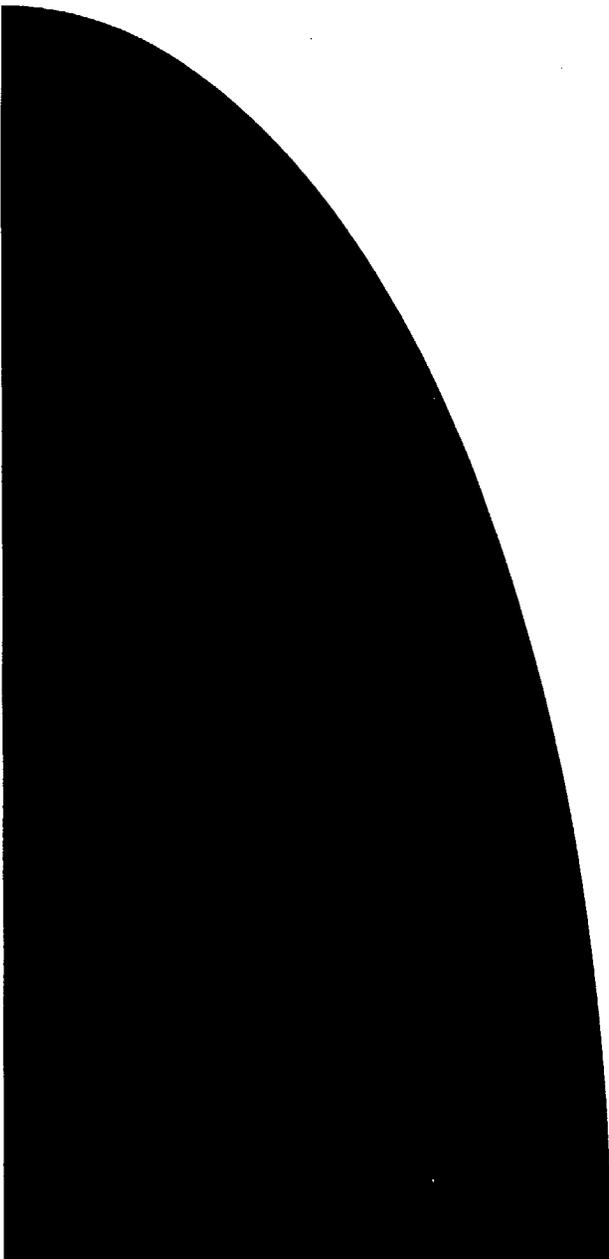
# Licensing Basis and History

- August 1987 Duke response stated control room intakes should be relocated
  - ◆ requested NRC concurrence prior to proceeding with modification



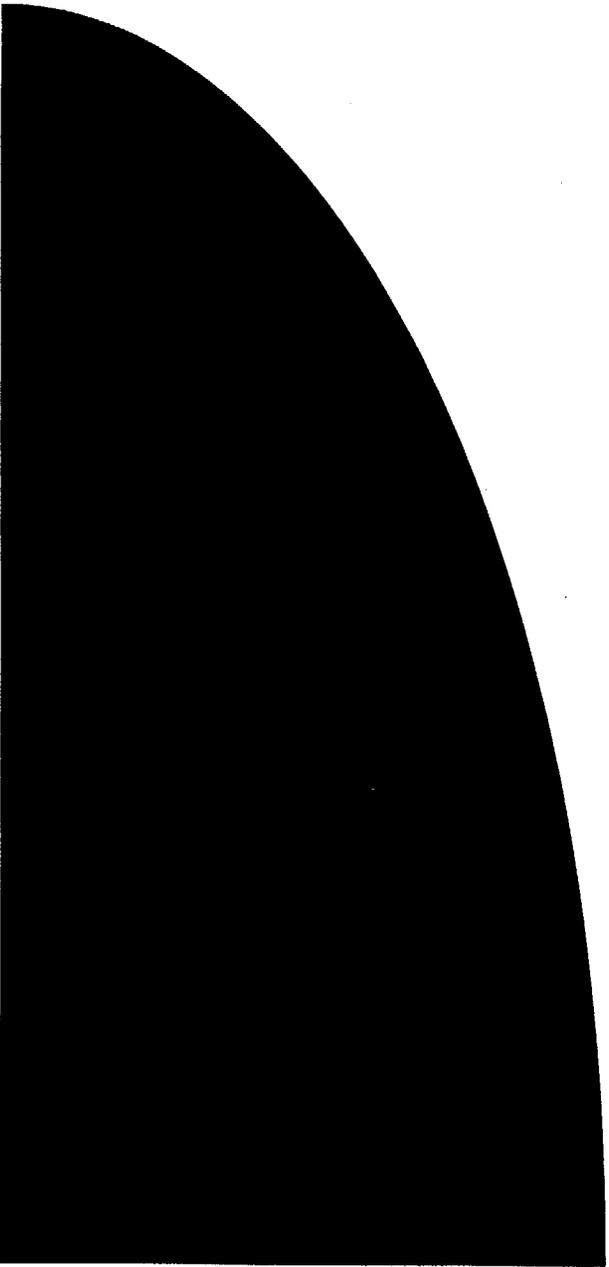
# Licensing Basis and History

- January 1988 Duke submittal of proposed CRVS Tech Spec
  - ◆ surveillance requirement verified positive pressure in control room with both booster fans on
  - ◆ tech spec bases stated that CRVS was designed with two 50% capacity filter trains



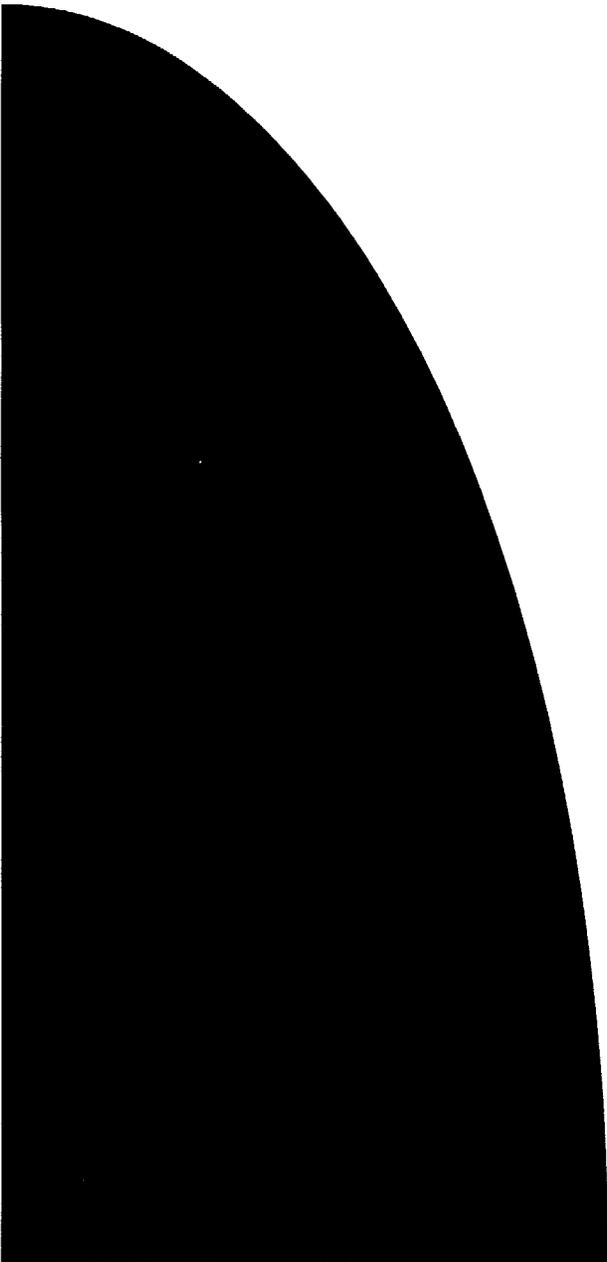
# Licensing Basis and History

- June 1989, NRC issued SER on CRVS Tech Spec
  - ◆ contained surveillance requirement to verify positive pressure with both booster fans on
  - ◆ recognized technical issues still remained, but additional shutdown and surveillance requirements of tech spec were conservative



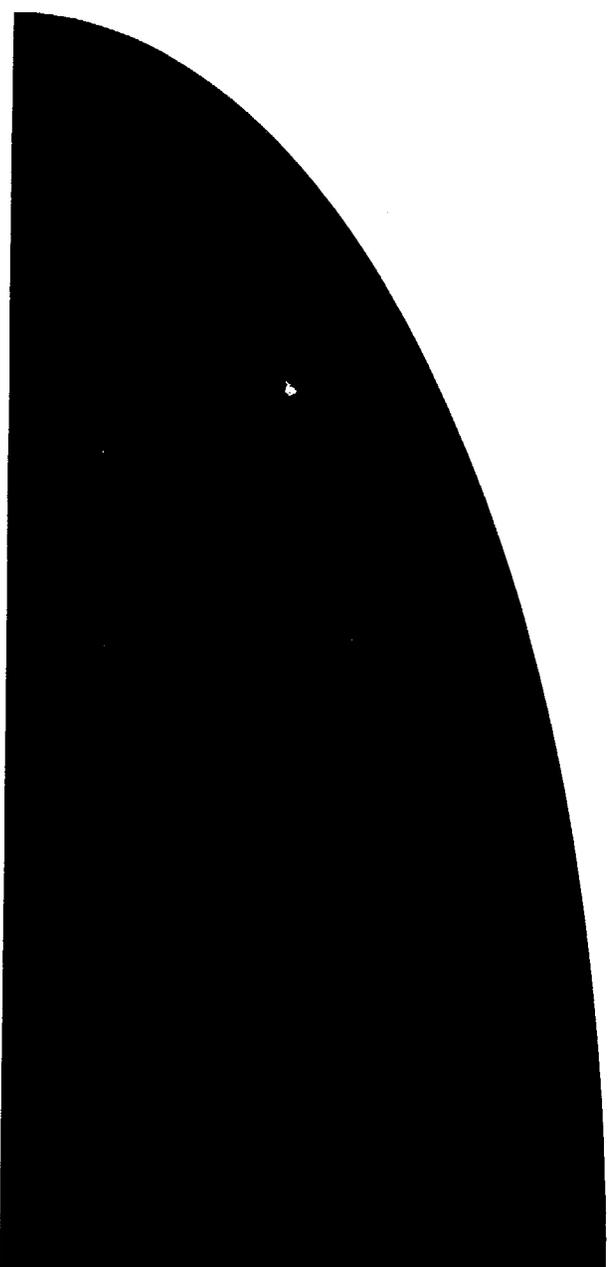
# Licensing Basis and History

- December 1989, following further review, NRC issued letter regarding relocation of intakes
  - ◆ stated that “the NRC staff is in the process of developing a new criteria and methodology for evaluating control room habitability issues which may lead to the conclusion that the proposed relocation of the intake is unnecessary.”



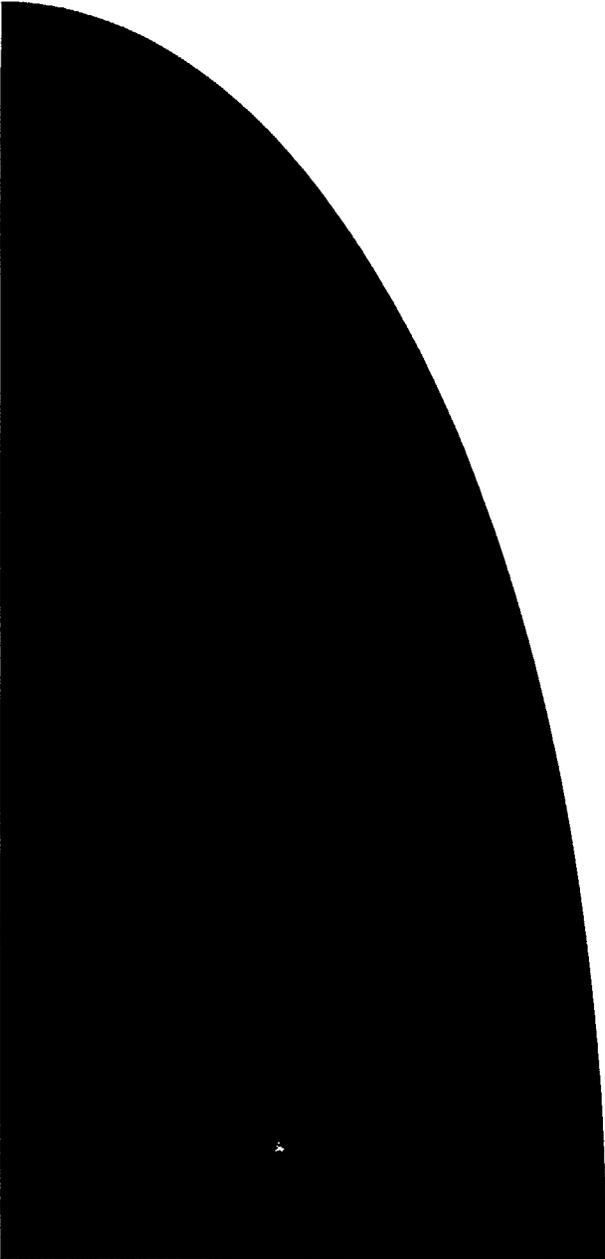
# Where Oconee is Going

- Creating new design basis control room and offsite dose analyses using alternate source term
- Studying various modification options
  - ◆ cost / benefit analysis based on dose reduction of various potential modifications



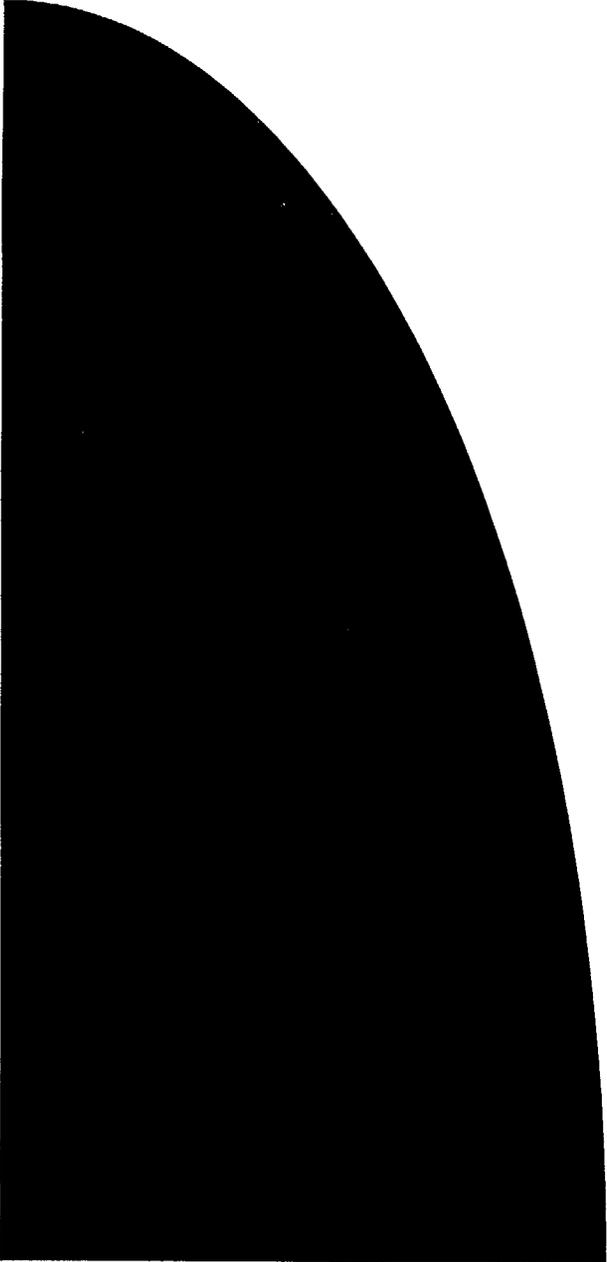
# Where Oconee is Going

- Considering potential submittal of several license amendments
  - ◆ adopting alternate source term
  - ◆ reducing allowed containment leak rate
  - ◆ revising containment leakage bypass fraction
  - ◆ control room pressurization versus unfiltered inleakage



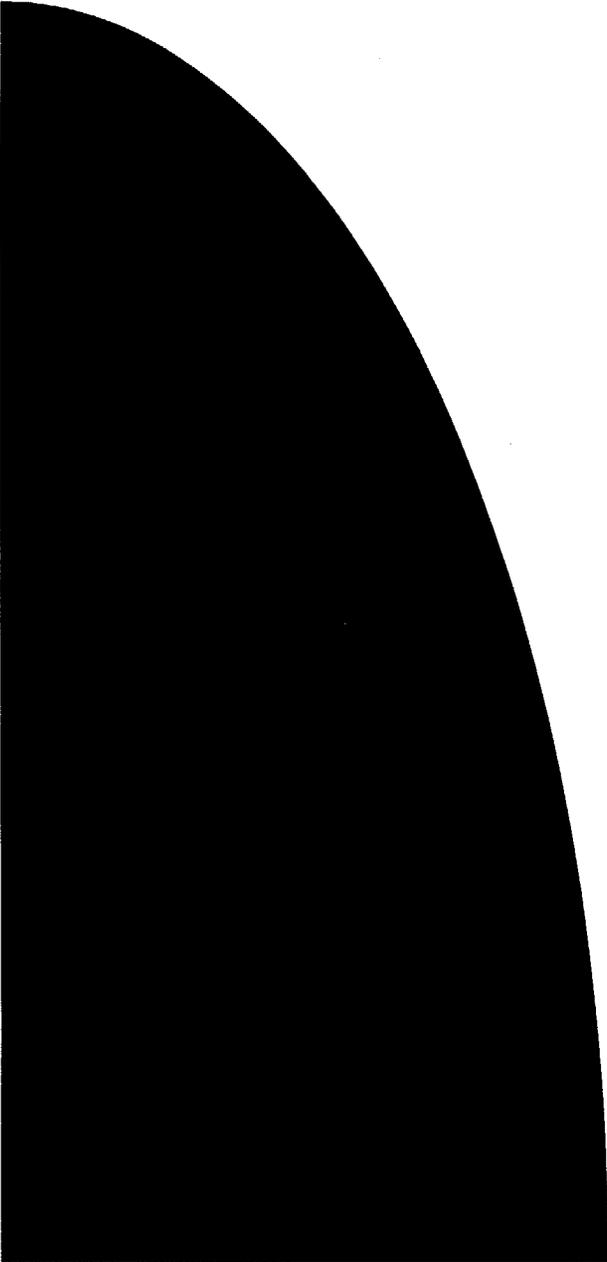
# Where Oconee is Going

- Incorporate alternate source term into Oconee's licensing basis
  - ◆ work with NRR to develop necessary actions



# Where Oconee is Going

- Develop consensus on appropriate dose analysis methodology
  - ◆ agreement to exclude passive failure
  - ◆ agreement on ARCON96 modeling techniques (e.g., ground versus elevated releases)
  - ◆ agreement on acceptable spray  $\lambda$  for iodine



# Wrap-Up

- Committed to resolving control room habitability issues at Oconee
- Significant overlap with generic industry issues
- Approach will allow closure of current open items
- Nuclear safety is maintained through improved testing, maintenance and analysis