MEETING SUMMARY DISTRIBUTION:

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Docket 50-244
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AUG 16 1979

Docket No. 50-244

LICENSEE: Rochester Gas & Electric Corporation (RG&E)

FACILITY: R. E. Ginna Nuclear Power Plant

SUBJECT: SUMMARY OF MEETING WITH RG&E

NRC and RG&E representatives met in Bethesda, Maryland, on July 24, 1979 for presentations by RG&E regarding:

- o RG&E decision to upgrade the Ginna Station Seismic Analysis of Category I Piping Systems;
- o RG&E responses to IE Bulletin 79-02, "Pipe Support Base Plate Design Using Concrete Expansion Anchor Bolts";
- o RG&E responses to IE Bulletin 79-07, "Seismic Stress Analysis of Safety Relating Piping - Algebraic Summation Error"; and
- o RG&E responses to IE Bulletin 79-13, "Inspection for Cracks In the Steam Generator Feedwater Piping."

The meeting attendees are listed in Attachments 2 and 3. The meeting progressed as summarized below.

1. Seismic Upgrade

The RG&E decision to upgrade the Ginna Nuclear Power Plant seismic analysis of Category I piping systems and the seismic upgrading program were discussed by various RG&E representatives within the context of the meeting outline provided by RG&E and included with this meeting summary as Attachment 1. The RG&E representatives stated that the analytical program and the potential resultant modifications will require three years for completion at an estimated cost of five million dollars. The RG&E schedule for completion of the program follows:

- data gathering
  5/1/79 started on initial systems outside containment.

  scope expanded and schedule accelerated upon receipt of IE Bulletin 79-14 and the July-August 1979 outage for Feedwater Crack inspections.

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7/31/79 data from inside containment to be completed.

9/15/79 following completion of inside containment data collection people will then be assigned to complete remaining systems outside containment. All field inspections and sketches complete.

- floor response spectra
containment, interior structure, and RCS being modeled now.

10/1/79 floor response spectra for containment complete.

1/1/80 spectra for other structures in program complete.

- piping analysis
piping models and support stiffness work already in progress on some systems; e.g. B-Main Steam, A-RHR.

1/1/80 analysis of systems inside containment complete.

1/1/81 analysis of systems outside containment complete.

- modifications

Spring 1981 inside containment complete.

Spring 1982 outside containment complete.

2. Pipe Support Base Plate Designs Using Concrete Expansion Anchor Bolts - IE Bulletin 79-02. RG&E presented additional information (documented by later RG&E submittal 7/26/79) to the July 6, 1979 response to IE Bulletin 79-02 which the staff concluded satisfied the intent of the bulletin.

3. Seismic Stress Algebraic Summation Error Information (later documented by RG&E letter dated July 26, 1979) provided by RG&E in addition to that provided earlier by RG&E letter to NRC dated April 25, 1979 was sufficient to satisfy the staff with respect to the requirements of Bulletin 79-07 for the three piping systems affected by the algebraic summation error, i.e. residual heat removal line - loop A, main steam line - loop B, and the charging line.

4. Cracks in Feedwater Piping - IE Bulletin 79-13. RG&E discussed the feedwater system nondestructuve examination that has been performed,

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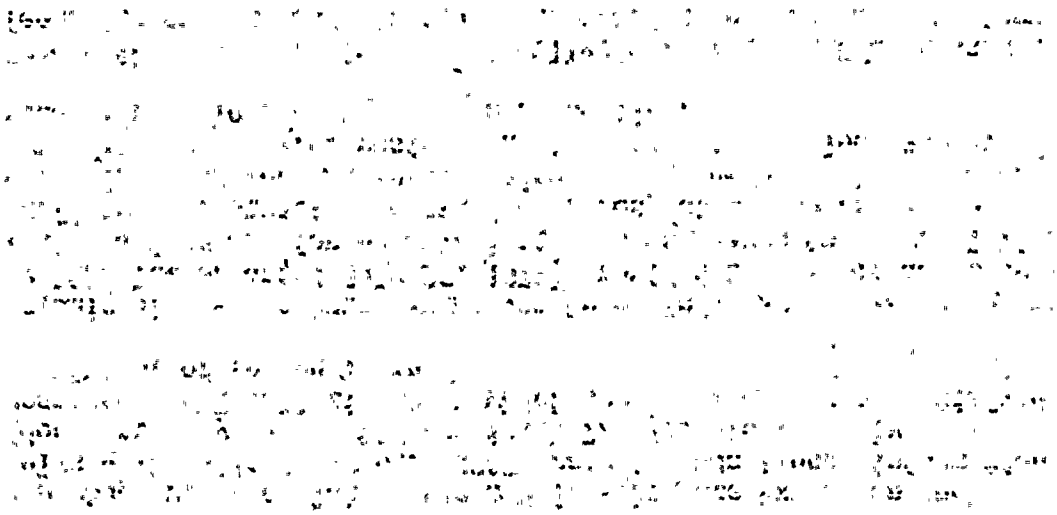

metallurgical examination results to date, crack repair program, and the cause of cracking. The crack indicators at the A and B steam generator feedwater nozzle to pipe welds in the base material of the 90 degree elbows that attach to the feedwater nozzle, based on ultrasonic and radiographic examination, were described in detail. Crack indications were estimated to be 1/32 - 1/16 inch in depth originating from the inside surface of the elbow. The extent of crack indications on the "A" steam generator elbow are approximately 300 degrees around the inside circumference while the "B" steam generator elbow is exhibiting crack indications around the entire (360 degrees) inside circumference.

Additional confirmatory information relative to the depth of cracks and results from the inspection of all other (18) feedwater pipe welds inside containment was presented. No other cracks were detected. The feedwater pipe elbows that contained the cracks (both loops) were replaced. The information presented by RG&E which included preliminary results from more recent metallurgical analysis of the cracks was later documented by RG&E letter dated July 27, 1979. The staff concluded that the RG&E responses to IE Bulletin 79-07 and the corrective action, replacement of feedwater pipe elbows, satisfy the requirements of the bulletin.

/S/

James J. Shea, Project Manager
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Division of Operating Reactors

Attachments:
As stated

cc:
See next page

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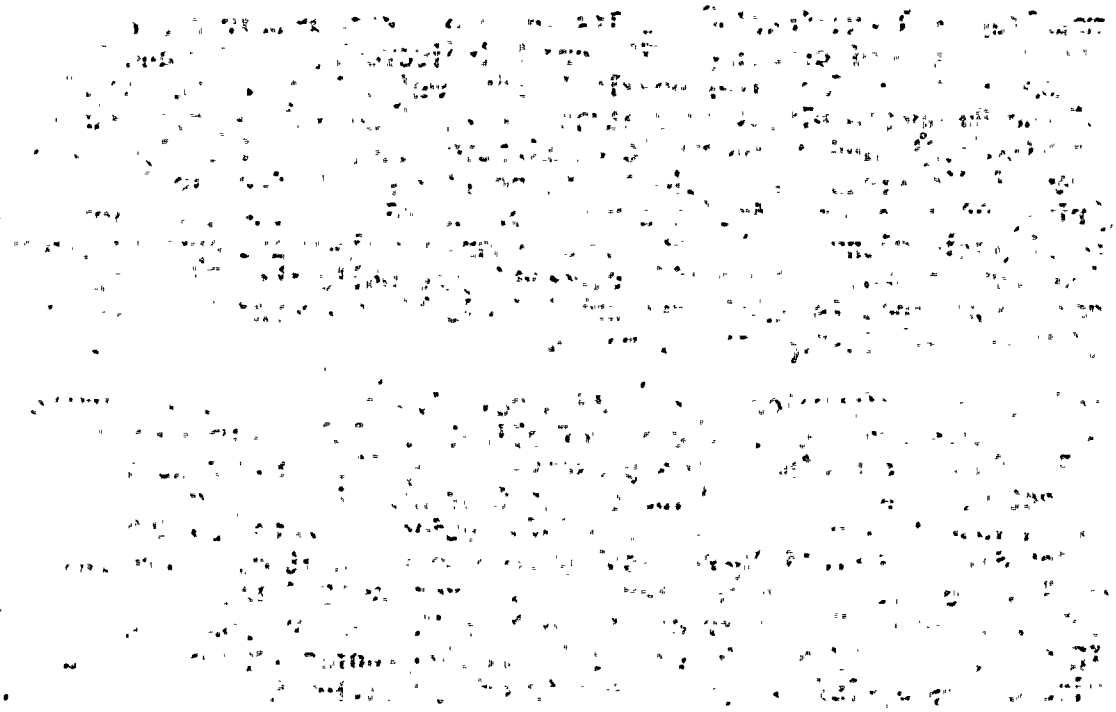

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RGE Decision to Upgrade Ginna Station Seismic Analysis of Category I Piping Systems

I 3 Year Program Commitment May 1979

- Dynamic analysis of essential safety systems to current standards for dynamic analysis.
- Modifications to piping as required to upgrade to new standard to extent practical.

II Basis for original Seismic Qualification

- Housner ground response spectrums .08 OBE, 0.2 SSE with 0.5% critical damping.
- Equivalent Static Analysis of 2½" and larger Cat I piping systems.
  - $S_{\substack{Seismic \\ SSE}} + S_{DW} + S_{press} \leq 1.8\ S_A$
- Field run piping 2" and less to conservative B31.1 code spacing criteria for vertical and horizontal forces.
- Design verification by dynamic analysis of 2 piping systems inside containment A RHR, B Main Steam.
- System walkdown by seismic Westinghouse, GAI, RGE engineers, June 1969.
- Documentation (minimal record keeping requirements of late 1960s).

III Challenges to existing Seismic Analysis

. Major Modification Programs (high energy backfits outside containment 1974, Standby Auxiliary System 1975, Spent Fuel Pit Cooling 1977)

. Corporate Decision 1974 to design and construct major modification to current codes and standards - Section 3 with dynamic analysis including structural response.

. NRC seismic SEP review program (structures, equipment, piping) Independent review of original seismic qualification using current analysis techniques.

. Current Regulatory Seismic Concerns.

IE Bulletins 79-02 Anchor Bolts

79-04 Velan Valves

79-07 Algebraic Summation

79-14 As-Built Configuration

IV Benefits to RGE of Seismic Upgrade Analysis Upgrade Program

- Provides a consistent design basis seismic analysis baseline for essential Cat I piping systems for future evaluation during next 10 years.
- Provides a level of design documentation for analysis and support design consistent with current practice and record keeping requirements.
- Permit a systematic approach to development of design and analytical data versus chaotic efforts associated with current and future bulletin concerns.
- Provide seismic input data based on current system configuration to SEP evaluators (scheduled to maximize manpower productivity).
- Provides consistent means of evaluation for future modification requirements (i.e. SEP, 3 Mile Island, High Energy Inside Containment, etc.).
- Upgrades plant seismic design to current industry standards. Includes effects of soil-structure interaction, structural amplification, higher damping values, multi-mode behavior.

GINNA STATION

SEISMIC UPGRADING PROGRAM
RGE/NRC MEETING
BETHESDA, MD
JULY 24, 1979

1. Scope

- structures
  containment and interior structure
  turbine, auxiliary, intermediate, control, diesel generator buildings
- systems
  seismic category I, 2 1/2" and larger, main runs critical 2" within above structures
  initial program - main steam, main feedwater, aux. feedwater, service water, containment spray, aux. spray, safety injection, residual heat removal
  CVCS - charging, letdown, seal water
  expanded program - reactor coolant system, component cooling system
- downgrading
  waste disposal system
- exclusions
  screenhouse
  standby aux. feedwater building and system
  spent fuel pool cooling system
  buried piping (principally service water)
  LOCA and pipe break
  No fatigue analyses being performed
  pressurizer relief valve discharge piping

2. Structural Analysis

- method
  original plant design utilized ground response spectra upgrading program will use floor response spectra dynamic lumped mass model
  1. coupled - containment and internal structure (includes RCS)

2. interconnected buildings - turbine, auxiliary, intermediate, control, diesel generator
3. 2D for symmetrical buildings
4. 3D for structures with significant torsional modes
5. large equipment masses included
6. vertical amplification of floors and beams calculated separately
7. soil structure interaction will be included in model

ground response spectra based on .08g OBE, .20g SSE

artificial time histories used as input for generating floor response spectra

differential displacements to be calculated for OBE only

- criteria

Reg. Guide 1.60 - response spectra
Reg. Guide 1.61 - damping values
Reg. Guide 1.92 - combination of modal responses

3. Piping Analysis

- method

original plant design utilized equivalent static analysis

upgrading program will use response spectra modal analysis

response spectra will envelope points of piping supports

3D dynamic model

1. support stiffnesses to be included
2. eccentric masses, such as valve operators, included
3. equipment masses and stiffnesses included where necessary
4. effect of reactor coolant system included for large secondary lines
5. effect of branch lines included with main run

loading conditions

1. normal - design pressure + deadweight S_h
2. design - OBE + design pressure + deadweight $1.2S_h$
3. SSE - SSE + operating pressure + deadweight $1.8S_h$
4. thermal - OBE displacements + thermal pressure + deadweight + thermal + OBE diesel S_h $S_a + S_h$

stresses due to OBE differential motion only will be calculated

- criteria

USAS B31.1-1973 - stress criteria (summer 1973 addenda)

Reg. Guide 1.60 - damping values
Reg. Guide 1.92 or RESAR 41 - combination of modal responses

criteria developed for allowable loads on equipment models, valves, and branch piping

4. Supp . Analysis

method

original plant component supports utilized manufacturers standards

fabricated supports designed and fabricated to AISC Code

upgrading program will analyze supports in 3 stages

1. calculation of stiffnesses for piping analyses
2. comparison of new loads against original
3. redesign of existing supports and design of new supports as necessary

embedments will be included in calculating support stiffnesses and evaluating integrity of existing supports

base plate flexibility will be included

loading combinations evaluated will be same as piping

- criteria
  ASME III, Subsection NF - stress criteria (1974)
  Reg. Guide 1.124 - service limits and loading combinations
  ACI-349, App. B - embedments

5. N fications

- existing supports
  replace load rated supports where new loads exceed existing rating
  replace or modify structural steel members (base plates) and welds as required to meet stress limits
  replace embedments where necessary to meet new loads and safety factors

- new supports
  add new supports where necessary to maintain piping stresses and equipment nozzle loads below allowable values

- structures
  local modification/reinforcement of existing structural steel and concrete where necessary for increased loads

6. Support

- isometrics
  as-built isometrics containing all "seismic input" information dimensions, wall thickness, materials, valves, support location and type, etc.

- stress reports
  summary and detailed stress reports for piping
  correspond to isometrics
  stresses at each critical location in piping system
  support and nozzle loads
  summary reports of support analyses
  comparison of calculated values with code allowables

- as-built drawings
  piping orthographic drawings
  pipe support location and detail drawings
  rated support loads

- floor response spectra
  for each Category I structure included in program at locations and elevations of Category I piping systems; and mechanical and electrical equipment

Attachment 2

LIST OF ATTENDEES

SEISMIC MEETING

JULY 24, 1979

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H. A. Levin
T. M. Cheng
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K. N. Jabbour
J. C. Glynn
D. Crutchfield
D. Ziemann
V. Noonan
S. Hosford
J. Fair

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J. Hutton
R. Smith
L. D. White, Jr.
J. C. Noon

Gilbert Associates

K. T. Momose
P. C. Shah

Westinghouse

R. J. Sero
W. S. Lapay

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Attachment 3

LIST OF ATTENDEES

PIPE SUPPORT PLATES & ANCHOR BOLTS
ALGEBRAIC SUMMATION PIPE STRESS ERROR
FEEDWATER PIPE CRACK MEETING

JULY 24, 1979

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W. J. Collins
R. A. Hermann
J. Strosnider
T. H. Liu
J. B. Henderson

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