



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
WASHINGTON, D. C. 20555  
January 6, 1981

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MEMORANDUM FOR: Robert A. Clark, Chief  
Operating Reactors Branch #3, DL

FROM: Leon B. Engle, Project Manager  
Operating Reactors Branch #3, DL

SUBJECT: SUMMARY OF DECEMBER 9, 1980 MEETING WITH PAUL-MONROE  
HYDRAULICS, INCORPORATED TO DISCUSS HYDRAULIC SNUBBERS  
AND INSERVICE INSPECTION/TEST-IN-PLACE CAPABILITY.

Representatives of Paul-Monroe Hydraulics, Incorporated and the NRC staff met in Bethesda, Maryland on December 9, 1980 to discuss the subject as noted above. A list of attendees is attached.

Introduction:

Paul-Monroe had requested a meeting with NRC staff whereby a presentation could be made to point out the safety-related features of its snubbers. The Paul-Monroe presentation included the basic design parameters and reliability aspects for both small capacity pipe and large capacity equipment snubbers. The inservice inspection features and the test-in-place capability for these snubbers were also presented.

Small Capacity Pipe Snubbers:

The new Paul-Monroe small piping snubber design has no moving parts except for the piston. A multi-baffled flow path provides an essentially constant resistance to all loads down to one (1) Hz. The snubber uses a combined Tefcel-metallic seal design which will provide environmental-qualification for exposures up to 35 mega-rads of radiation. Also, the hydraulic fluid used in the pipe snubbers is GE 1154, an acid-free fluid that will stand up to exposures at 100 mega-rads of radiation. The small pipe snubber is so designed that there is no external reservoir and thus there is minimum external surfaces and appendages which could be damaged by outside activities. In addition, a new pipe clamp design is also offered to compensate for thermal expansion of the piping and thus improve the pipe rigidity to above five times that of the associated pipe snubber. Visual luminescent indicators are part of the pipe snubber design which can be seen from a distance and indicate fluid level and piston position. These features could minimize the time required for surveillance testing.

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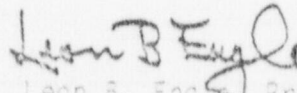
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Large Capacity Equipment Snubbers:

The equipment snubber is of the traditional design. However, the poppet valve is so designed to offer a performance insensitive to the contact position which is a desirable feature from the standpoint of reliability.

An in-service, in-place testing module called Testan is presently being finalized for mobile use within required service areas for nuclear power facilities. This module will have the capability of testing snubber performance parameters without the removal and reinstallation of the snubber being tested. It will not only reduce the time and effort required for testing, but will also avoid possible snubber damage resulting from the removal and reinstallation of a snubber being tested. (The Testan general arrangement and test equipment hook-up diagrams are attached.)

For additional information regarding the Paul-Monroe snubbers discussed above, please contact Mr. Horace K. Shaw (\*432-7364) of the Operating Reactors Assessment Branch, Division of Licensing, within the Office of Nuclear Reactor Regulation.



Leon B. Engle, Project Manager  
Operating Reactors Branch #3  
Division of Licensing, NRR

Attached:

1. Attendee List
2. Paul-Monroe Testan Figures

cc: w/attachments  
See next page

MEETING SUMMARY DISTRIBUTION

Licensee:

\* Copies also sent to those people on service (cc) list for subject plant(s).

Docket File

NRC PDR

L PDR

TERA

NSIC

ORB Rdc

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DEisenhut

RPurple

RTedesco

TNovak

GLainas

RReid

Tippolito

SVarga

DCrutchfield

RAClark

ORB Project Manager

Licensing Assistant

OELD

AEOD - JHeltemes

IE-3

SShowe (PWR) or CThayer (BWR), IE

RFraley, ACRS (16)

Program Support Branch

GZech

JOlshinski

BGrimes, DEP

Sheldon Schwartz, DEP

FPagano, EPLB

Steve Pinos, EPDB

Mtg. Summary Dist.

NRC Participants

EBrown            DReiff

LEngle           HShaw

DGuzy

RKiesel



## ATTACHMENT 2

TESTIAN  
GENERAL APPRA  
/QUARTER FIELD TEST

R. PAUL-MINROE  
 HYDRAULICS, INC.  
 10000 15th Avenue, S.W.  
 Seattle, Washington 98148  
 (206) 735-1100

USED IN JANUARY	WALK A. H. H. H.	WALK A. H. H. H.	WALK A. H. H. H.
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## TEST EQUIPMENT HOOK-UP

CUSTOMER

STANDARD

DRAWN

DATE

APPROVED

DATE

SCALE

JOB NO.

USED IN  
ASSEMBLY

AM

12/29/75

