

Bruce Sheffel
Committee Chairman
Detroit Edison

Carl Osman
Committee Vice-Chairman
Carolina Power & Light

Tom Anderson
Special Projects
PECO Energy Co.

Dave Anthony
Quality Assurance
Illinois Power Company



Steering Committee for Implementation of Appendix VIII, ASME Code Section XI

Mark Richter
Finance
Baltimore Gas & Electric

Frank Leonard
Program Operations -- RPV
Tennessee Valley Authority

Program Operations -- Piping/Bolting
Southern Nuclear Operating

Mark Richter
Computer Modeling
Baltimore Gas & Electric

May 29, 1996

Mr. Jack R. Strosnider
Chief, Materials and Chemical Engineering Branch
Division of Engineering
Nuclear Regulatory Commission
OWFN-7D4
11555 Rockville Pike
Rockville, MD 20852

SUBJECT: NRC ASSESSMENT OF THE PDI PROGRAM

Dear Mr. Strosnider:

As a result of our meeting on March 7, 1996 I am enclosing the revised and augmented responses which were discussed during the meeting. These positions were developed by the PDI Steering Committee. The responses include the original 13 open items. Item 9 appears to be the only item of disagreement remaining from our March meeting. We would like to come to agreement on this item. Our response details why we believe that our current program is highly challenging and represents a considerable improvement over that which currently exists. PDI believes that it is in the best interest of all to allow use of the PDI program as an alternative approach to current requirements and thus clear the way for improved NDE personnel qualification and generic techniques to be applied in our industry.

If I can answer any questions or be of further assistance please call me (313) 586-1848.

Sincerely,

A handwritten signature in dark ink, appearing to read "Bruce J. Sheffel".
Bruce J. Sheffel
Chairman PDI

160055

cc: PDI Steering Committee
F. L. Becker, EPRI NDE Center
J. Spanner, EPRI

9610170071 960529
PDR ORG NRR
PDR

Handwritten initials "LF03 1/1" and a signature that appears to read "Dan Naisack".

RD-8-2 PDI

Correspondence to the PDI Committee should be directed to:
Bruce Sheffel • Detroit Edison • 6400 N. Dixie Highway 210-A1B • Newport, MI • 48166

OR6 NRR

**RESPONSES TO
NRC ASSESSMENT OF THE PDI PROGRAM
OPEN ITEMS**

The following is a list of responses to the 13 open items listed in the August 11, 1995 NRC Assessment Report. The reply and a brief basis for the reply is listed for each item.

95-01-01

Additional examination techniques developed during performance demonstrations and clarification of certain items should be included in examination procedures PDI-UT-1 and PDI-UT-2.

Reply

Generic procedure have been reviewed and the revised. The revised procedures are being forwarded to the NRC. It is our understanding that this submission resolves this item.

95-01-02

For PDI-UT-3, integrate test performance and equipment requirements into a single section of the procedure and include more detailed instructions

Reply

The Generic procedure has been revised. A copy of the revised procedure will be forwarded to the NRC. It is our understanding that this action resolves this item.

95-01-03

An examiner who encounters equipment combinations not previously demonstrated as part of his qualification should receive training on the equipment before its use.

Reply

The Procedures and Protocol of the PDI Program meet the requirements of the ASME Code.

Basis

Utility and Vendors must address this subject in their Written Practice. Utilities are required to assure that examiners are familiar with the procedures and equipment that they will use before proceeding with their examinations. Table I of the Generic Procedures and the Performance Demonstration Qualification Summary are already quite detailed and voluminous. A copy of Table I for the Generic procedures and the PDQS Use Guide are included as Attachments 1 & 2. It is our understanding that this item is resolved with the submission of this information.

95-01-04

When a performance demonstration does not include all of the techniques listed in the qualification procedure, a candidate should demonstrate proficiency in using the other techniques before qualification is complete.

Reply

The Procedures and Protocol of the PDI Program meet the requirements of the ASME Code.

Basis

Utility and Vendors must address this subject in their Written Practice. Utilities are required to assure that examiners are familiar with the procedures and equipment that they will use before proceeding with their examinations. In the case of the Generic procedures, PDI believes that the alternative techniques which are allowed are sufficiently similar as to not be of concern.

95-01-05

While monitoring of the effectiveness of generic procedures appears to be adequate, written guidance for the oversight function should be developed.

Reply

The TWG and the Performance Demonstration Administrator will continue to track the effectiveness of the Generic procedure. Guidelines for the evaluation of previously qualified procedures have been included in the PDI instruction manual, a copy is included as Attachment 3. A copy of the documentation package for one procedure is included as Attachment 4. Attachment 4 includes:

1. Master Generic UT Procedure Registry / Essential Variable Review,
2. Acceptance of the Procedure by the Authorized Inspection Agencies
3. Procedure/Code Comparison Breakdown of Essential Variable Implementation Compliance,
4. The procedure.

It is our understanding that provision of this information will close this item.

95-01-06

This item was previously resolved.

95-01-07

This item was previously resolved.

95-01-08

Complete the electronic data retrieval system for qualification records. The format of the Qualification Summary Sheet (PDQSS) could cause a reviewer to miss the exceptions to the test or miss-identify a candidate's IGSCC qualifications. The current method of

finding each Qualification Calibration Data Sheet (QCDS) in the candidate's file and comparing it to the equipment files is cumbersome.

Reply

This activity has been completed and the process is now fully automated. A copy of the PDQS Use Guide is included as Attachment 1. This item is now considered to be resolved.

95-01-09

The Code does not address IGSCC or single side access acceptance criteria in the supplements. Therefore, PDI established the acceptance criteria which the team considered weak and in need of improvement.

Reply

A revised policy was implemented immediately following the exit interview by the NRC Assessment Team, in January of 1995. It is now a requirement that each candidate must find at least 2 of 3, 3 of 4, or 4 of 5 IGSCC or far side only access flaws before they are given credit for these conditions. If they fail this criteria but pass the Supplement 2 acceptance criteria, they may be given an additional 5 flaws. The candidates must then correctly identify at least 4 of 5 of the flaws in the supplemental examination before they may receive IGSCC or single side access endorsements.

Basis

The PDI demonstration criteria was developed on the basis that it would include a distribution of the most important conditions such as IGSCC, single side access, difficult geometry conditions and also include the full range of thicknesses and diameters required by the Code. It has been the intent of the PDI Program that there would be sufficient number of examples of each type to challenge the examiners. That is, if an examiner could not handle a particular condition they would have great difficulty passing the acceptance criteria.

The performance on IGSCC samples is shown in Figure 1. The performance on flawed grading units is shown for candidates who passed or failed the total austenitic test (with IGSCC option). The first bin (90-100%) contains the results for detections 3 of 3 or 4 of 4. Both passed and failed candidates are listed. The Percentage number in the top bar is Passed divided by total candidates in that bin. Candidates who detect 100% of the IGSCC flaws in their test have only a 54% chance of passing the whole austenitic test. This decreases to 30% for those who detect 2 of 3 IGSCC flaws (60-70% bin). The individuals who failed may have failed for several reasons including: false calls, or missed detections on the remainder of the examination. Figure 2 depicts the performance on unflawed IGSCC grading units in a manner similar to Figure 1. The total number of unflawed IGSCC grading will normally vary from 6 to 10 units which is at least twice the number of unflawed grading units. Again, performance at 90% to 100% provides only a 57% probability of passing the remainder of the test. Calling 60 to 70% of the unflawed grading units correctly provided only a 31 % chance that the candidate would pass the

examination. Figures 3 and 4 provide the same data for the entire test set including the 308 IGSCC samples. The dual acceptance criteria is more challenging than one might assume. Candidates with a false call rate of greater than 10% have at best a 34% chance of passing the overall criteria. Candidates who have a detection rate of 70 to 80% have only a 31% chance of passing the overall criteria.

Table I compares the relative degree of difficulty between the Previous BWROG-IGSCC examination and the PDI IGSCC demonstration. While it is true that the testing under the three Party Agreement uses more flaws, it is also true that the overall degree of difficulty of the PDI demonstration is equal to if not more difficult than the previous examinations. In terms of the total weld length examined, the false call criteria and success rate the PDI demonstration is more challenging.

TABLE I
COMPARISON OF PDI IGSCC DEMONSTRATION WITH THOSE
ADMINISTERED UNDER THE THREE PARTY AGREEMENT

	3 PARTY AGREEMENT	PDI
Length of weld IGSCC	80"	47" Average
Length Austenitic	80"	146" Average
Length Ferritic	0	52" Average
Length Total	80"	198" Average
# IGSCC Flaws	10	3, 4, or 5
# Austenitic Flaws	10	10, 11, or 12
# Ferritic Flaws	0	3
# Total Flaws	10	13-15
# Failure to Detect	2 of 10	2 of 13-15
		(no more than 1 IGSCC)
# False Calls Allowed	20	3
inches of False Calls	20	9
Success Rate 1st Attempt	30%*	26% (IGSCC option)
Success Rate 2 Attempts	54%*	43% (IGSCC option)
Successful/total attempts	NA	34% (IGSCC option)
Previously Qualified 1st attempt /2nd attempt	49/72%*	NA
Length sizing accuracy	not measured	0.75" RMS
Austenitic Pipe Diameters	20 and 28 inch	G2, 4, 6, 12, 20, 28, 32 inch
Austenitic Pipe Thicknesses	.8 to 1.5 inch	.237 to 3.0 inch
* Includes successful completion of written examinations		

In summary the PDI believes that the current revised criteria for IGSCC is adequate to assure that only qualified examiners are able to meet these requirements.

95-01-10

PDI should ensure that adequate details are included in the qualification procedures for IGSCC mid-wall qualification.

Reply

The generic Procedures have been revised to include additional detail. Copies of the Generic Procedures have been supplied to the NRC.

95-01-11

The tolerance on the determination of the location of a flaw used by PDI is double the tolerance allowed in Appendix VIII, Supplement 4. PDI should initiate action with the Section XI Committee on the tolerance changes that may be needed.

Reply

Code Case N-545 revises the location tolerance based on the metal path distance to the indication. This Code Case has been accepted by the Code. However: PDI accepts as a detection, a reported indication that can be shown, without a doubt, to have originated from an intended defect.

Basis

This location error is for the purpose of assisting in the grading of demonstrations. However when there is no doubt that the candidate has detected the intended flaw, they should be given credit for the detection.

95-01-12

PDI Should develop a clear position on the use of software for the performance demonstration tests as compared to performance in the field.

Reply

The PDI has adopted a policy on software. This policy requires that the candidate have a software control program which will be applied to the software used during the qualification. The software which is used for the demonstration is documented to the degree that a knowledgeable utility individual can assure that the same software is being used in the field examination. This question is considered to be resolved.

Basis

Responsibility for assuring appropriate software is used for examinations is the responsibility of the Utility. The PDI requires that vendors have a software control program and that this program is auditable by utilities. The PDI also supplies the necessary documentation necessary for utility personnel to make the required determinations when the software is applied in the field.

95-01-13

PDI should develop a means to prove that the improvised scanners used in the performance demonstrations are not superior to the scanners used for the field ISI.

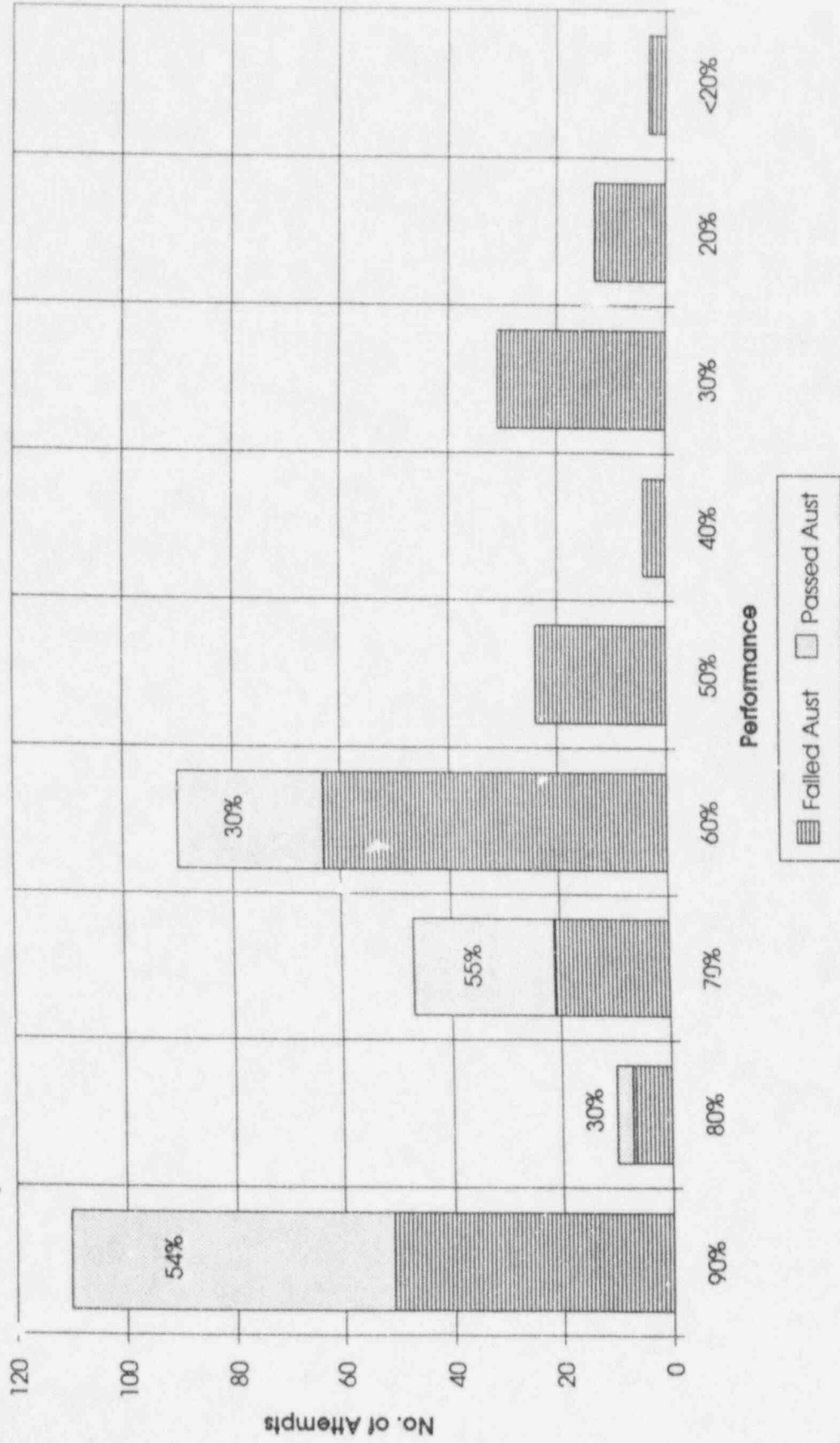
Reply

The Procedures and Protocol of the PDI Program meet the requirements of the ASME Code.

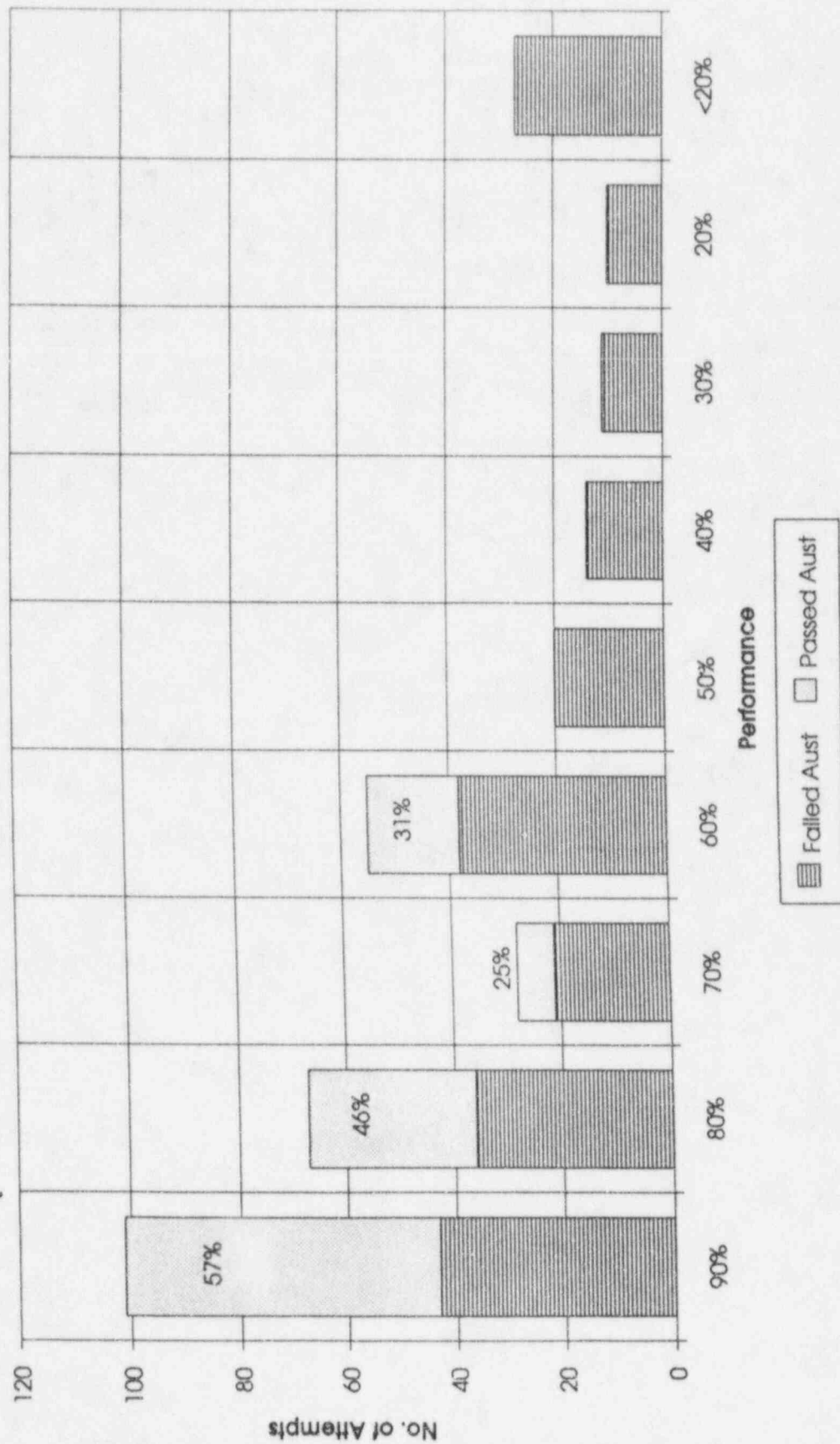
Basis

The transducer holders, their suspension and contact pressure are the primary attributes of concern. The positioning accuracy backlash etc. were not considered essential variables by the Code. ISI vendors are normally required by their operating procedures and by utilities to provide evidence of positioning accuracy. The ISI vendors will be informed that they should be prepared to provide the NRC with evidence that their scanning mechanisms provide the required accuracy.

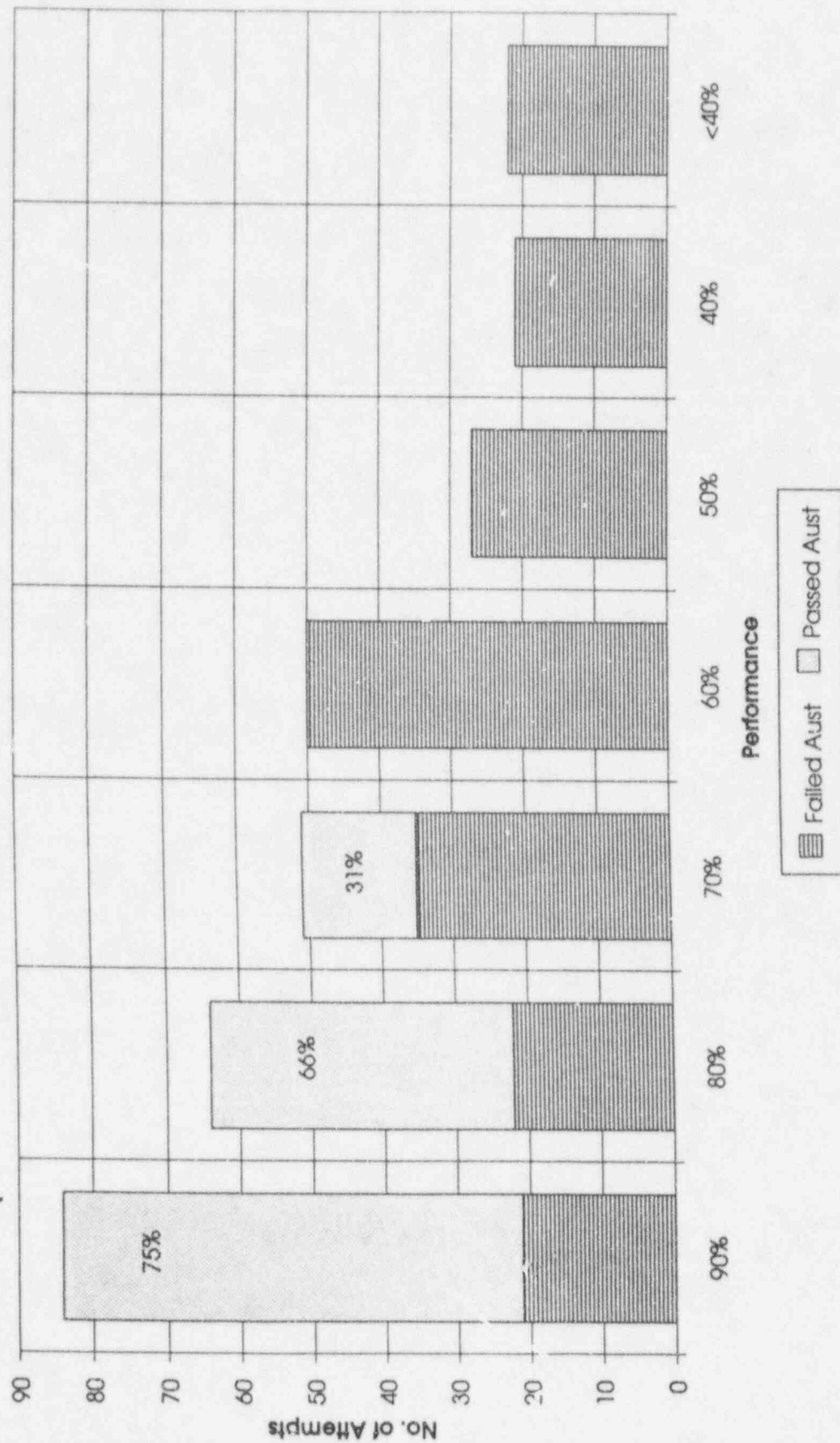
FGU's - P308 Specimens Only



UFGU's - P308 Specimens Only



FGU's - Austenitic + P308 Specimens



UFGU's - Austenitic + P308 Specimens

