

ASME QME-1–2007
(Revision of ASME QME-1–2002)

Qualification of Active Mechanical Equipment Used in Nuclear Power Plants

AN AMERICAN NATIONAL STANDARD



**The American Society of
Mechanical Engineers**



ASME QME-1–2007
(Revision of ASME QME-1–2002)

Qualification of Active Mechanical Equipment Used in Nuclear Power Plants

AN AMERICAN NATIONAL STANDARD



**The American Society of
Mechanical Engineers**

Three Park Avenue • New York, NY 10016



Date of Issuance: November 28, 2007

The next edition of this Standard is scheduled for publication in 2010. There will be no addenda issued to this edition.

ASME issues written replies to inquiries concerning interpretations of technical aspects of this Standard. Interpretations are published on the ASME Web site under the Committee Pages at <http://cstools.asme.org> as they are issued.

ASME is the registered trademark of The American Society of Mechanical Engineers.

This code or standard was developed under procedures accredited as meeting the criteria for American National Standards. The Standards Committee that approved the code or standard was balanced to assure that individuals from competent and concerned interests have had an opportunity to participate. The proposed code or standard was made available for public review and comment that provides an opportunity for additional public input from industry, academia, regulatory agencies, and the public-at-large.

ASME does not “approve,” “rate,” or “endorse” any item, construction, proprietary device, or activity.

ASME does not take any position with respect to the validity of any patent rights asserted in connection with any items mentioned in this document, and does not undertake to insure anyone utilizing a standard against liability for infringement of any applicable letters patent, nor assume any such liability. Users of a code or standard are expressly advised that determination of the validity of any such patent rights, and the risk of infringement of such rights, is entirely their own responsibility.

Participation by federal agency representative(s) or person(s) affiliated with industry is not to be interpreted as government or industry endorsement of this code or standard.

ASME accepts responsibility for only those interpretations of this document issued in accordance with the established ASME procedures and policies, which precludes the issuance of interpretations by individuals.

No part of this document may be reproduced in any form,
in an electronic retrieval system or otherwise,
without the prior written permission of the publisher.

The American Society of Mechanical Engineers
Three Park Avenue, New York, NY 10016-5990

Copyright © 2007 by
THE AMERICAN SOCIETY OF MECHANICAL ENGINEERS
All rights reserved
Printed in U.S.A.



CONTENTS

Foreword	vii
Committee Roster	ix
Organization of QME-1	x
Summary of Changes	xii
Section QR	
General Requirements	1
QR-1000 Scope	1
QR-2000 Purpose	1
QR-3000 References	1
QR-4000 Definitions	1
QR-5000 Qualification Principles	3
QR-6000 Qualification Specification	4
QR-7000 Qualification Program	4
QR-8000 Documentation	6
Nonmandatory Appendices to Section QR	
QR-A Seismic Qualification of Active Mechanical Equipment	7
QR-A1000 Scope	7
QR-A2000 Purpose	7
QR-A3000 References	7
QR-A4000 Definitions	8
QR-A5000 Earthquake Environment and Equipment Response	9
QR-A6000 Seismic Qualification Requirements	11
QR-A7000 Qualification Methods	15
QR-A8000 Documentation	22
Attachment A Guidelines for Qualification by Similarity (Indirect Method)	24
Attachment B Examples of Qualification of Pumps and Valves by Analysis	28
Attachment C Qualification of Pumps and Valves Using Natural Earthquake Experience Data	38
Appendix QR-A Figures	
B-1 Pump Assembly	29
B-2 Finite Element Formulation of Pump Assembly	30
B-3 Butterfly Valve Assembly	34
B-4 Finite Element Formulation of Butterfly Valve Assembly	35
C-1 Seismic Motion Bounding Spectrum Horizontal Ground Motion	39
C-2 Limits of Experience Data for Motor-Operated Valves and Substantial Piston-Operated Valves	41
C-3 Limits of Experience Data for Air-Operated Diaphragm Valves, Spring- Operated Pressure Relief Valves, and Piston-Operated Valves of Lightweight Construction	42
Appendix QR-A Tables	
QR-A6210-1 Damping Values: Percent of Critical Damping	12
QR-A7422-1 Reduction Factors	20
A-1 List of Input Parameters	26
A-2 Comparative List of Physical Parameters	27
B-1 Calculated Frequencies for Pump/Motor Assembly: Print of Frequencies	31
B-2 Evaluation of Behavior at Critical Locations	33
B-3 Allowable Stresses at 200°F for 4-in. Valve	36



B-4	Beam Stresses, psi, for ASME Service Level B	36
B-5	Beam Stresses, psi, for ASME Service Level C	36
B-6	Plate Stresses, psi, for ASME Service Level B	36
B-7	Plate Stresses, psi, for ASME Service Level C	36
B-8	Other Locations	37
B-9	4-in. Valve Nodal Displacements, in., for ASME Service Level C	37
QR-B	Guide for Qualification of Nonmetallic Parts	43
QR-B1000	Scope	43
QR-B2000	Purpose	43
QR-B3000	References	43
QR-B4000	Definitions	43
QR-B5000	Requirements	43
QR-B6000	Methods of Qualification	45
QR-B7000	Documentation	48
Section QDR	Qualification of Dynamic Restraints	49
QDR-1000	Scope	49
QDR-2000	Purpose	49
QDR-3000	Definitions	49
QDR-4000	Qualification Principles and Philosophy	49
QDR-5000	Functional Specification	52
QDR-6000	Qualification Program	52
QDR-7000	Documentation Requirements	57
Nonmandatory Appendices to Section QDR		
QDR-A	Functional Specification for Dynamic Restraints	59
QDR-A1000	Scope	59
QDR-A2000	Purpose	59
QDR-A3000	References	59
QDR-A4000	Definitions	59
QDR-A5000	Functional Specification Contents	59
QDR-A6000	Filing Requirements	61
QDR-B	Restraint Similarity	62
QDR-B1000	Scope	62
QDR-B2000	Examples of Design Similarity	62
QDR-C	Typical Values of Restraint Functional Parameters	63
QDR-C1000	Scope	63
QDR-C2000	Functional Parameters	63
QDR-C3000	Aging and Service Condition Simulation Qualification Program	63
Section QP	Qualification of Active Pump Assemblies	64
	Introduction	64
QP-1000	Scope	64
QP-2000	Purpose	64
QP-3000	References	64
QP-4000	Definitions	65
QP-5000	Qualification Principles and Philosophy	65
QP-6000	Qualification Specification	65
QP-7000	Qualification Program	67
QP-8000	Documentation	69
Nonmandatory Appendices to Section QP		
QP-A	Pump Specification Checklist	70
QP-A1000	Scope	70
QP-A2000	Applicable Documents, Codes, and Standards	70
QP-A3000	Design and Construction Requirements	70



This is a free preview. Purchase the entire publication at the link below:

[Product Page](#)

-
- Looking for additional Standards? Visit Intertek Inform Infostore
 - Learn about LexConnect, All Jurisdictions, Standards referenced in Australian legislation
-