



PROGRAM DOCUMENT

161 Thorn Hill Road
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PD2104

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AEROSPACE QUALITY ASSURANCE, PRODUCT STANDARDS,
QUALIFICATION PROCEDURE, GAS TURBINE OILS

0 INTRODUCTION

It is essential that products defined by Industry Standards conform to the requirements of these Standards, and that the quality of the products be consistently maintained. To this effect an Industry consensus-based product qualification system has been established. The qualification system is based on:

- The approval of the manufacturer's quality system, as defined in ISO 9001 or AS/EN/AISQ 9100.
- The qualification of the product according to the procedure defined in this standard.

This industry-managed product qualification program is administered by the Performance Review Institute.

1 SCOPE

This Program Document (PD) describes the qualification procedure supporting aerospace product standards as adhered to by the SAE Aerospace Propulsion Lubrication, E34, Qualified Products Group (QPG).

Approval and/or certification of a specific gas turbine oil in aero and aero derived gas turbine engines is the responsibility of the individual equipment manufacturer exclusively and is not implied by compliance or qualification of a specific gas turbine oil by the QPG to an SAE product standard.

2 REFERENCES

Unless otherwise stated, reference in this document to any related document means the edition and all amendments current at the date of use of that document.

PRI operating procedures provide that "This report is published by PRI to advance the state of technical, engineering, and quality sciences. The use of this report is entirely voluntary, and its applicability and suitability for any particular use, including any patent infringement arising therefrom, is the sole responsibility of the user."

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AS5780	SAE Aerospace Standard; Specification for Aero and Aero-Derived Gas Turbine Engine Lubricants
AS/EN/ AISQ9100	Quality Systems – Aerospace – Model for Quality Assurance in Design, Development, Production, Installation, and Servicing
ISO9001	Quality Management Standard
PD2000	PRI Program Document; Governance and Administration of an Industry Managed Product Qualification Program
PD2001	PRI Program Document; Qualified Product Management Council Procedures for Qualified Product Groups
ISO 17025	General Requirements for the Competence of Calibration and Testing Laboratories

3 DEFINITIONS

3.1 Qualified Product Group (QPG) Mandated Body by the QPMC:

A mandated body designated by the PRI Qualified Product Management Council (QPMC) in accordance with PRI PD2000. This body is responsible for assessing whether manufacturer's products comply with the relevant standards. The Mandated Body is known as a Qualified Products Group (QPG) and is composed of members from the Original Equipment Manufacturers (OEMs) and Government Agencies. Membership of the QPG, confidentiality requirements and code of ethics are referenced in PD2000 and PD2001. The QPMC has mandated a QPG for Aerospace Gas Turbine Oils.

3.2 Original Equipment Manufacturer (OEM):

An Original Equipment Manufacturer is a manufacturer of an end item "system" such as an airframe, engine, auxiliary power unit or integrated generator.

3.3 Verification Testing:

Verification Testing is any testing by a laboratory, not affiliated with the laboratory used to generate the qualification data, to verify the qualification data.

3.4 Product Qualification:

The procedures followed by the QPG and oil manufacturer resulting in the placement of a product on the Qualified Products List.

3.5 Qualified Products List:

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A Qualified Products List is a document, maintained and issued by PRI, which lists products that have met the requirements of the relevant Product Standard and the qualification process requirements of PD2104.

3.6 Qualified Reference Number:

Each product will be designated a unique identifier, a qualification reference number (QRN)

The QRN number will identify Supplier, formulation (base-stock plus additive package), manufacturing location(s) and re-brands. The QRN will consist of an alphanumeric system, such as:-

XY/1/r1; whereas XY = supplier code,
/1 = formulation & manufacturing reference number
/r1 = re-brand identification reference number

each QRN will be updated when a change is approved by the QPG

3.7 New Products:

New Products are formulations that will be designated by a new QRN. New Products may be based on a previously qualified Formulation but incorporate a major change from that previously qualified. New Products will be designated by a new brand designation.

3.8 Grand-Fathered Products:

Grand-Fathered Products are products that are currently qualified to an existing OEM, government or military QPL, and which are anticipated to pass all additional requirements for the Product Standard within 24 months from submission.

3.9 Proposed Product Change:

Any changes to those product related items listed below constitute a *Product Change and requires re-qualification*. The manufacturer shall inform PRI of any proposed *Product Changes* to the following and the date to be accomplished:

- a. Changes in the oil formulation.
- b. Changes in the composition of the base-stocks.
- c. Changes in the composition of the additives.
- d. Changes in the source of first tier suppliers and/or manufacturing plant location for the base stocks, additives, or finished oil. Oil manufacturers shall demonstrate equivalent controls over second tier raw material suppliers.

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- e. Changes in the manufacturing process and methods of manufacture.
- f. Changes in the brand name under which a formulation is marketed (including re-brands).
- g. Business changes such as mergers, acquisitions by other companies, plant closings, and discontinuation of products.

3.9.1 Minor Change

A minor change is one that does not result in a measurable change in the performance of the oil. The QPG will determine if a proposed Product Change is minor, and if so, the proposed Product Change will proceed through the Re-Qualification (minor change) process outlined in Appendix A. Any such changed product will be assigned a new QRN but may keep the original brand name.

3.9.2 Major Change

A major change is one that can result in a measurable change in the performance of the oil. Should the QPG determine that a proposed Product Change is major, the QPG will direct the manufacturer to proceed through the Product Qualification process as though this is a new oil.

3.10 Periodic Review of Product

All product qualification and re-qualification will be subject to review after a stipulated period. (see 4.3.4).

3.11 Independent Laboratory:

An Independent Laboratory is one that is not affiliated with the lubricant manufacturer, or an OEM, or a government test facility. Independent Laboratories shall be capable of oil properties testing. ISO17025 accreditation is preferred. However, if non-accredited laboratories are used then evidence of appropriate supplier controls and audit shall be provided.

3.12 Acronyms:

OEM	Original Equipment Manufacturer
PD	Program Document
QPG	Qualified Products Group
QPL	Qualified Products List
QPMC	Qualified Product Management Council
PRI	Performance Review Institute
QRN	Qualification Reference Number

4 PROCEDURES

4.1 Compliance with PRI PD2000

The procedure of the QPMC Qualified Products Group (QPG) shall be in compliance with PRI PD2000.

4.2 Change Control of Qualified Products

Any production product made by any of the revised changes as listed above (section 3.9) which require approval from PRI, shall not be shipped without prior written approval from PRI approving the changes. PRI will only approve the changes on written notification of acceptance by the QPG. Manufacturers shall seek qualification of their *Proposed Product Changes* per the process in section 4.3.3.

4.3 Manufacturer Request for Product Qualification

The manufacturer seeking product qualification shall send a written request for approval to PRI (see below) and shall provide the information required by 4.4. The manufacturer shall describe the products to be qualified and identify the type of qualification, *New Product*, *Grand-fathered Product*, *Proposed Product Change*, or *Periodic Review of Product*. The manufacturer shall also state the class of the product as defined in the product standard, Standard Performance Capability (SPC) or High Performance Capability (HPC).

4.3.1 New Product Qualification Requests

For a *New Product* qualification, the manufacturer must submit a qualification test plan stating when and where the qualification testing is to be performed including verification testing. When test plans are submitted, the manufacturer shall specifically request approval of his qualification test plan, and of the place and facilities proposed to achieve this plan. The proposed products tested must be manufactured according to the manufacturing and inspection requirements applicable for eventual proposed production. The process for a *New Product* qualification is shown in Appendix A.

4.3.2 Grand-Fathered Qualification Requests

For the Grand-Fathered qualification of a lubricant brand name, the manufacturer must submit formulation details, summary report of test data, qualification report or evidence of OEM approval for the most recent qualification of the proposed product to an existing military or OEM-user QPL. The QPG shall determine the adequacy of the test data as well as the adequacy of any verification data. The QPG may request additional testing, where necessary to meet the appropriate requirements of the standard. A submitted grand-fathered product may not have test data to demonstrate compliance with all the requirements of the current standard. In such cases

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the timescales for periodic review (section 4.3.4) will be reduced. The process for a grand-fathered qualification is incorporated in Appendix A

4.3.3 Product Change Requests

For a *Re-qualification of Proposed Product Change*, the manufacturer must submit a written description of the proposed change(s) to the qualified product(s) previously qualified under a given standard. The manufacturer must submit a re-qualification test plan stating what, when and where the qualification testing is to be performed including verification testing. When test plans are submitted, the manufacturer shall specifically request approval of his qualification test plan, and of the place and facilities proposed to achieve this plan. The proposed products tested must be manufactured according to the manufacturing and inspection requirements applicable for eventual proposed production. The process for a *Product Change* re-qualification is incorporated in Appendix A.

4.3.4 Periodic Review

For a Periodic Review of a product with a Product Qualification Listing, the manufacturer will have been notified of the qualification expiration date at the time of qualification. PRI will also issue a reminder letter to the supplier to inform them that their qualified product is up for periodic review. The manufacturer must respond by submitting a letter requesting re-qualification to PRI, stating that no changes (defined in section 3.9) have been implemented and providing a summary of product manufacture Quality Control evidence as specified in the product standard. The process for the Periodic Review of a product and its re-qualification is incorporated in Appendix A

The Product Qualification shall be valid for a maximum of five years, or until product or process changes occur, or the product is withdrawn or discontinued.

In the case of Grand-Fathered oils, which do not have test data to demonstrate compliance with all the requirements of the current product standard, the qualification will be valid for a maximum period of 24 months. During such time evidence demonstrating full compliance with the Product Standard shall be obtained and provided to PRI to allow continued qualification.

4.3.5 All requests for product qualification shall be directed to:

Performance Review Institute (PRI)
161 Thorn Hill Road
Warrendale, PA 15086
Attention: QPL Processing Coordinator

4.4 Requirements for Product Qualification

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The request for product qualification shall be accompanied by:

- a) Evidence of Compliance with AS/EN/ISO 9100, or ISO 9001.
- b) The list of approvals or qualifications already granted for the product or similar products; or status of evaluation for such approvals if under way, and time to completion;
- c) Evidence that product qualification testing has been or will be performed by a laboratory that complies with the requirements stated in clause 4.7.2.

4.5 PRI Preliminary Review of Product Qualification Request.

Upon receipt and review of the data required by 4.3 and 4.4, including the qualification test data or test plan, PRI shall forward the request to the Mandated Body, the QPG.

4.6 QPG Review of Product Qualification Request

The manufacturer's request for product approval shall be evaluated and replied to by the QPG within 45 calendar days. If approval cannot be granted, the reply shall clearly and specifically identify the basis for the disapproval including any deficiencies in documentation, the proposed test plan, qualification test data, and/or identified manufacturing and process controls. The reply shall also include details regarding verification testing, if required. The reply may request that corrective actions be taken in the event the submitted information does not comply with the requirements of the product standard.

A requirements checklist aid is provided in Appendix B for QPG guidance.

4.7 Manufacturer Support of QPG Evaluation

4.7.1 Access to Background Material

The QPG shall have access to the manufacturing and inspection requirements of the concerned products. It shall also have access to the record of relevant inspections carried out at the various stages of manufacture. A record shall be kept to reflect any modifications of these documents with the date, responsible person identification and reason for change.

4.7.2 Qualification Test Data

Qualification test data for an oil formulation shall consist of a complete set of test data demonstrating compliance with the appropriate lubricant class of the Product Standard.

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Where multiple tests results are available and / or multiple laboratories have been used to obtain a specific result, all the data shall be reported.

Verification of the qualification data is required and shall consist of test data from a subset of the specification requirements in agreement with the QPG. A lab, not affiliated with the qualification test lab shall produce verification test data. Test data will include name and address of all test labs used, accreditation details, date of test, test method, specification number and revision, formulation number, batch number, batch date, and lot number, as applicable. The specification number and revision, formulation number, batch number, batch date, and lot number shall be the same for qualification and verification data. The QPG will be allowed to witness any testing listed in the test plan if so requested.

Test labs used for qualification and verification testing shall be one of the three types listed below:

- a) Applying manufacturer's test lab - ISO17025 certified or compliant.
- b) Independent laboratory as defined in clause 3.11.
- c) OEM (user) or Government test lab

Test data shall be verified as follows:

- a) If the manufacturer chooses to produce a full set of test data from their ISO17025 certified/compliant lab as proposed in the approved test plan submitted to PRI, then the data shall be verified by verification test data produced by an Independent Laboratory or OEM/Government lab.
- b) If the manufacturer chooses to have an Independent Laboratory or OEM/Government lab produce a full set of test data as proposed in the approved test plan submitted to PRI, then the qualification data shall be verified by verification test data produced by a second lab not affiliated with the lab used for qualification. The verification lab can be the manufacturer's ISO17025 certified or compliant lab, an Independent Laboratory, or an OEM/Government lab.
- c) If verification testing is not possible (if single source laboratory is only capability) then the oil manufacturer must provide information on relevant controls adopted to ensure accuracy and quality of results.

4.8 Qualification Test Reports

At the end of the qualification test program, the manufacturer shall be responsible for the production of a detailed report, giving the obtained results and external verification data citing the report numbers. This report shall be submitted to PRI for review and approval by the QPG. The QPG shall review, assess and communicate

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the results of the review of the test report to PRI and the manufacturer within 45 calendar days. Corrective actions may be requested where data submitted is incomplete or otherwise deficient.

4.9 QPMC Approval

If requested by the submitting oil manufacturer or in the case of an appeal by the manufacturer, the QPMC shall review the QPG report and recommendation. In the absence of an appeal, the QPG report shall be final, and PRI shall list the products concerned on the appropriate QPL on behalf of the QPMC, unless PRI PD2000 criteria have not been met.

The QPL shall contain the following information:

- a) Reference to the SAE product standard and class
- b) Name of manufacturer and place of manufacture
- c) QRN (specific to each formulation)
- d) Product 'Brand' name / description
- e) Issue date
- f) Expiry date of qualification
- g) Qualification type (New Product, Grand-Fathered, Product Change, Re-Qualification)

Notes:

a. OEM Authority

The OEM should acknowledge whether the organization which granted qualification and the rules with which they conformed are satisfactory to him, taking into account his contractual commitments and/or legal obligations. If this is not satisfactory to him, the user may conduct or have conducted on his behalf complementary evaluation judged necessary.

b. Supplier Responsibility

Inclusion of a product on the QPL does not relieve the supplier of its contractual obligations to deliver products that comply with all specification requirements.

c. Responsibility for Quality Assurance

Inclusion of a product on the QPL does not constitute a waiver of any requirement for inspection, for process control, or for maintenance of quality control procedures during production. It also does not in any way relieve the user of its contractual obligation to ensure that the delivered products comply with the specification requirements.

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4.10 PRI Confidentiality Requirement

- a) All information provided to PRI shall be treated in accordance with the proprietary and confidentiality requirements of PRI. All members of the QPG will have to sign acceptance of these agreements.
- b) The PRI will provide a written description of these requirements to any OEM , Government Agency, oil manufacturer requesting the information.
- c) All information provided to PRI shall be treated in accordance with the confidentiality requirements of PRI and any existing agreements with individual OEM members of the QPG.
- d) The oil manufacturer is responsible for clearly marking any confidential and proprietary information provided to the PRI.

4.11 In-Service Problem Reporting

AS5780 requires that the lubricant manufacturer shall notify PRI immediately in the event that a batch of qualified product fails any requirements of the Standard, resulting in a product recall being necessary. . In such an event the PRI shall then notify the QPG of the problem. The oil manufacturer shall be required to provide the QPG with a description of the problem and course of action taken to date. The QPG may, at its discretion require further data to be provided and/or action to be taken. Any further data required shall be limited to the test requirements of the Standard. The oil manufacturer will issue bi-weekly updates to the QPG until the problem is resolved. The QPG shall review the information and make any appropriate recommendations.

5. APPENDICES

- 5.1 New & Grand-Fathered product qualification and control of change process; Appendix A
- 5.2 Checklist for Qualification Data submitted; Appendix B

APPENDIX A
PD2104 PROCESS FLOWCHART

Who

What

How

Oil Mft

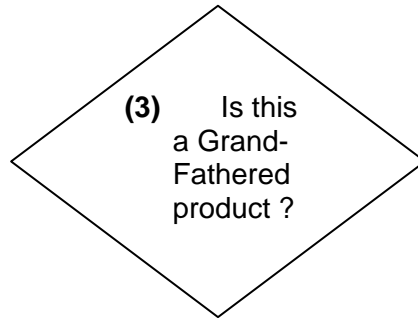
(1) Submit request for product qualification (Identify as new / Grand-Fathered) or change

Forward request to PRI with relevant details, test plan, evidence of OEM / MIL QPL approval (if Grand-Fathered)

PRI

(2) Ask QPG to review request/ test plan

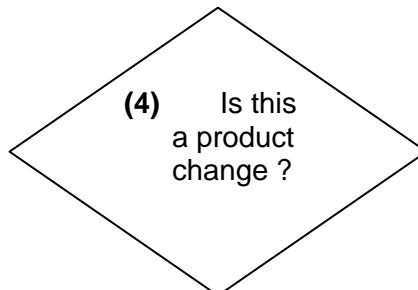
Forward request and details to QPG with deadline for response



Yes →

Go to (8)

No ↓



No →

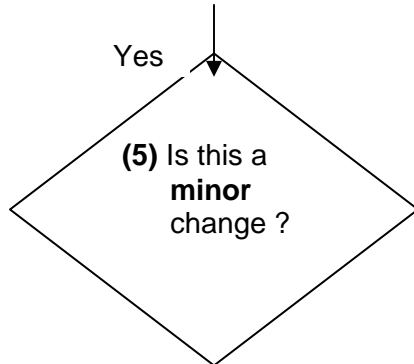
Go to (6)

QPG

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QPG

Yes



No

Mft informed change is Major and treated as New Product
RE-SUBMIT (1)

Yes

QPG

(6) Is the test plan and preliminary evidence ok

No

Inform PRI + Oil Mft with request for additional information
Repeat 1, 2 etc

Yes

QPG

(7) Proceed with test program

Inform PRI + Oil Mft test plan is acceptable

Oil Mft

(8) Submit product test report

Full test report prepared plus evidence of compliance with AS5780 and para. 4.7.2 to PRI

For Grand-fathered product submit evidence, formulation and relevant previous qualification documents

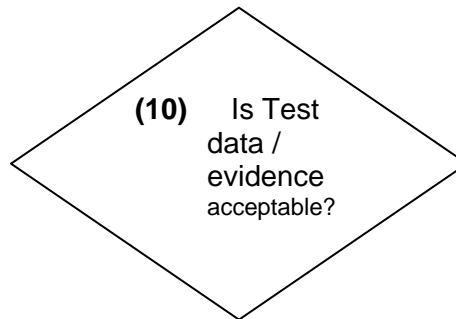
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QPG

(9) Review of Test Data/Evidence

QPG to evaluate all evidence in support of qualification within 45 days

QPG



Yes

Go to **(14)**

No

QPG

(11) Identify further test requirements and supporting evidence to meet shortfall

Inform Oil Mft + PRI of problems and define actions

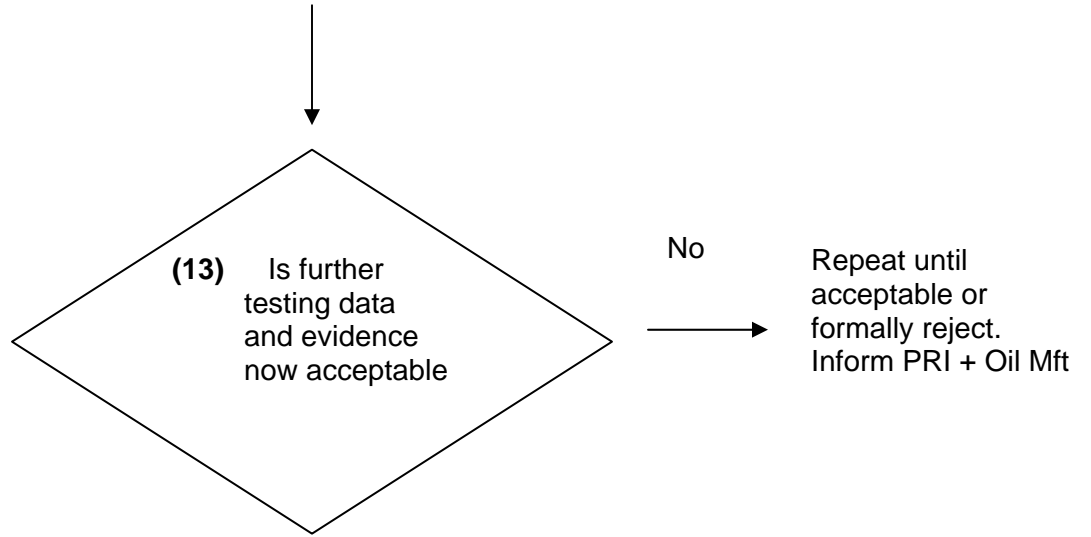
Oil Mft

(12) Additional testing and new evidence to meet **(11)**

Oil Mft to provide further evidence and submit additional report

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QPG



Repeat until acceptable or formally reject. Inform PRI + Oil Mft

Yes

PRI

(14) Allocation of QRN and QPL Web update

PRI notifies oil mft of web revision / approval + date for periodic review and re-qualification

**Appendix B
PD2104 CHECK LISTS (Guidance for QPG)**

	2104 para REF	Acceptable (with comments)	Queried (with comments)	Rejected (with comments)
Requirements for Product Qualification	4.4			
Evidence of Compliance with AS9100, or equivalent				
Description of the company (organization, products manufactured, manpower, facilities (Non-mandatory section))				
Street address of the plant at which the product is being manufactured				
CAGE code if available				
List of approvals or qualifications already granted for the product or similar products				
Status of evaluation for such approvals if Under way, and time to completion				
AS9100 compliance for subcontractors and flow down of qualification requirements				
Evidence that product qualification testing has been or will be performed by an ISO 17025 certified or compliant laboratory				
QPMC Approval / Qualification	4.9			
Reference to the SDO standards defining the products				
Type and/or class of the product, if any;				
Name or manufacturer and place of manufacture				
Product designation				
Qualification test data	4.7.2			
Complete set of test data demonstrating compliance with appropriate class of AS5780				
Verification of the qualification data				
Name and address of all test labs used				
Date of test				
Test method				
Specification number and revision				
Formulation number				
Batch number				

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Batch date				
Lot number				
Test labs used for qualification and verification testing	4.7.2			
Manufacturer's test lab – ISO 17025 certified or compliant				
Independent test lab capable of oil properties testing – ISO 17025 certified				
OEM (user) or Government test lab – ISO17025 certified or compliant				
Background Material	4.7.1			
Manufacturing and inspection requirements				
The record of the inspections carried out				
Written operations, work instructions and process controls				
Product Change Requests	4.3			
Details of all changes				
Description of the formulation changes				
Process				
Manufacturing equipment and machinery				
Business changes such as mergers, acquisitions by other companies, plant closings and discontinuation of products				
Requalification test plan				
When and where the qualification testing is to be performed				
Third party testing				
Manufactured according to the manufacturing and inspection requirements applicable for eventual proposed production				
Movement of manufacturing facilities, machinery, processes and personnel to a new location				
Test data shall be verified	4.7.2			
Grandfathered qualification	4.3.2			
Summary of test data or qualification report used for the most recent qualification				
Existing military or OEM-user QPL				

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Adequacy of the test data				
Adequacy of any second or third party lab accreditation				
Additional testing, where necessary to meet current requirements of AS5780 in time for periodic review.				