Procurement Engineering Standard Purchase Clause		
Code:	**EQ SEALS B**	
Title:	**EQPR FOR PARKER SEALS EQ O-RINGS**	**R007**
Applicable to:	Safety Related and EQ Active Mechanical Items and spares	

1.0 QUALIFICATION BY ANALYSIS AND TESTING

This EQPR is intended to be used when buying elastomeric O-rings and seals manufactured by Parker Hannifin/Seals Corporation (hereinafter Parker) from Seals Unlimited Canada (hereinafter Seals Unlimited) for use throughout Ontario Power Generation (OPG) nuclear sites in safety-related applications which require being environmentally qualified (EQ).

Parker and Seals Unlimited are advised that the item shown in the purchase order item description have been assessed and environmentally qualified by the OPG Engineer for use in safety-related applications.

Once it has been established that an item is environmentally qualified (EQ), it is necessary to ensure that successive purchases of the item will be equivalent to the qualified item. In order to do so, it is necessary to clearly establish the critical characteristics of the qualified item so that these can be need to be replicated and verified. These critical characteristics may be shown on one or more of a number of different documents including the, manufacturer's drawing(s), test reports, qualification reports, bill(s) of material, specification(s), manufacturer's catalogue etc. So as not to limit the generality of the foregoing list, the document that describes the critical characteristics that need to be replicated shall be referred to herein as the *"primary controlled document".*

For EQ materials it is essential that the primary controlled document clearly identifies the materials of construction as well as other critical characteristics of the item. See EPRI NP-5652 and TR-102260 for a more detailed explanation of critical characteristics.

In every instance, the content of the primary controlled document shall be under rigorous revision control. In instances when the primary controlled document defines most but not all critical characteristics, and in instances when the primary controlled document provides configuration or material selection options, the required characteristic or material option(s) shall be stipulated in the purchase order item description.

2.0 CHANGES IN DESIGN AND SUBSTITUTION OF QUALIFIED MATERIALS

Changes made to Environmentally Qualified O-rings and seals that were originally tested or previously assessed and qualified by OPG are to be tracked. Parker/Seals Unlimited shall advise OPG in the event that changes take place in the following areas: design of the product, material/compounds used, manufacturing methods, non-destructive testing procedure, and test reports.

Some changes, which may appear insignificant for the commercial applications and not deem to be reported to the client (since fit, form, and function are met), can invalidate the equipment qualification.

Parker/Seals Unlimited shall notify the OPG Buyer using the forms identified below, if any changes have or are to take place to the item shown in the purchase order item description which is assessed and qualified by OPG.

Parker/Seals Unlimited shall ensure contractual provisions and QA program requirements imposed on suppliers and sub-suppliers are such that Parker/Seals Unlimited will be notified of any such changes that may occur within the supply chain. If any of these changes take place then Parker/Seals Unlimited shall notify the buyer using the Vendor Parts/ Material Substitution Control form N-Form-10115 during bidding or the Concession Application form N-Form-10393 subsequent to contract award.

As an alternative to the preceding paragraph, Parker/Seals Unlimited shall notify the buyer, using the same forms, if for any reason it is unable to provide assurance that there have been no such changes since the item was originally evaluated/ tested for use in a nuclear safety-related application.

The buyer will forward all such notifications to the Design Authority in OPG. The responsible Design Authority shall make all decisions relating to the need to re-evaluate and/or re-test the item. Although the Design Authority may solicit Parker/Seals Unlimited input to the decision, the decision of the Design Authority will be final.

Parker is advised that:

The item will be installed in a nuclear safety system. That system will be required to operate following a very unlikely but theoretically possible design basis accident. If such an accident occurred the items could be

subjected to a harsh environment consisting of chemical and pressure transients, radiation, steam, and elevated temperature and pressure or submergence. It is possible that the design basis accident could occur at a time when the items have already been subjected to many years of normal operation and are nearing the end of their useful operating life. These items have been rigorously evaluated, and the OPG Engineer expects that they will perform their intended safety function following exposure to their harsh environment.

OPG's Environmental Qualification Assessment (EQA) has established that the items may not perform their intended safety function if there is a substitution of materials, changes in design or changes in manufacturing methods. This is especially true for changes or substitutions of non-metallic components used in the construction of these items. Some non-metallic components are known to be subject to degradation in a harsh environment and can deteriorate quickly when exposed to steam, heat, or especially when exposed to high levels of radiation. The OPG Engineer accepts that changes in design, sub-suppliers, materials, and manufacturing methods may be necessary as technology and manufacturing processes change with time. The OPG Engineer also accepts that companies may not be able to track all changes that occur over a long period of time. It is the OPG Engineer's objective to minimize unnecessary changes that would necessitate a reevaluation of the items' ability to perform their intended safety function following a Design Basis Accident as even minor changes may dictate the need to retest or re-qualify the items. In any event, it will certainly dictate the need to evaluate the effect of the change to ensure that the new item will perform the same intended safety function as the items that were previously qualified. The "changes" referred to in this section are interpreted to mean any changes in materials of construction, changes in manufacturing processes that affect interchangeability, changes in form, fit and function, or any changes from the original design or performance requirements. Insignificant changes that do not affect any of these criteria (i.e. that do not result in a change in the item part number) are considered to be outside the scope of this requirement.

3.0 QUALITY ASSURANCE PROGRAM FOR ENVIRONMENTALLY QUALIFIED ITEMS

For the items that Parker/Seals Unlimited manufactures/supplies to OPG, Parker/Seals Unlimited shall implement and maintain a quality assurance program that provides assurance that the design, materials used in construction, methods used in fabrication/construction, non-destructive testing, are such that the Parker/Seals item both meets the design requirements and is equivalent to the Parker item evaluated and environmentally qualified by OPG Engineer for use in nuclear safety-related applications.

In order to provide this assurance Parker quality assurance program shall meet the requirements of at least CSA CAN 3 Z299.3-1985 QA standard, including the requirement for product traceability.

Parker's quality program as described in their QA Manual as audited by NUPIC and reviewed /accepted by OPG to the requirements of CSA Z299.3-85 along with the requirements specified in the purchase order is acceptable to OPG to meet this requirement.

Traceability is required by the contract, and therefore in accordance with CSA Z299.3-1985 QA standard, Parker shall assign to each product or service or batch a unique identification/unique identifier such as serial number, date code, batch code to distinguish apparently identical products.

All the items shall be traceable to the Parker manufacturing locations audited/accepted by OPG.

Parker's Distributor in Canada – Seals Unlimited shall also implement a quality assurance program that:

- Provides assurance that there is no substitution of product specified in the purchase orders without prior approval. Such requests are to be submitted to the OPG Engineer for approval using N-FORM-10393,
- Provides rigorous controls to ensure that batch trace controls are not lost during the process of receiving, storing, packaging, and shipping the subject products.
- Conveys/transfers information to and from Parker in an accurate and timely fashion.

In order to provide the required assurance, the Seals Unlimited quality assurance program shall meet the requirements of CSA Z299.3-1985 (distribution activities).

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1.0 INSPECTION AND TEST PLAN AND CRITICAL PROCESS PROCEDURE APPROVALS

The products are normally supplied from either Parker or Seals Unlimited inventories. Parker is a recognized authority on the products. It is therefore not necessary to submit either an Inspection and Test Plan (I&TP) or procedures for customer approval.

2.0 REGISTRATION WITH TECHNICAL STANDARDS AND SAFETY AUTHORITY

This Section is N/A

3.0 SEISMIC QUALIFICATION REQUIREMENTS

This Section is N/A

4.0 MARKING AND TAGGING OF THE ITEM

Each individual item is to be permanently marked with the following:

- Manufacturer's model designation or part number reference
- Manufacturer's unique identifier such as serial number, batch/lot control number or cure date/ manufacturer date (to ensure traceability)

All marking and tagging shall be clear, unambiguous and indelible.

5.0 PROTECTION FROM DEGRADATION DURING SHIPMENT OR STORAGE

Each O-ring/seal shall be individually packaged and protected from degradation during shipment and suitably packaged for long term storage in military spec paper (Marvel wrap no. 2 flat, Mil-B-117E style 1 class C) in accordance with ASME NQA-1-2000 Subpart 2.2 Level B or the predecessor industry standard ANSI-N45.2.2 Level B. Individual packaging shall provide protection from ultraviolet (UV) radiation. Individual sealed packages must not be re-sealable so that the integrity of the package can be used to provide assurance that the O-ring contained inside is exactly as labeled.

Since packaging is intended to protect the O-ring/seal from degradation during storage, the packaging shall be clearly marked with the following:

- Manufacturer’s name and model/ part number,
- Manufacturer’s unique identifier such as serial number, batch/lot control number or cure date/ manufacturer date (to ensure traceability),
- Date on which the shelf life will expire
- OPG Purchase Order number and Line Item number,
- OPG Cat Id number,

The packaging shall be clearly marked with the following notations:

- *“This package contains an EQ item. The information on the package provides traceability information. Do not remove this item from its package (receipt inspection included) until ready for installation in the intended application. If this package has been opened prior to issue to the installer, the O-ring/seal is not suitable for use in EQ applications”.*
- *“Store in ASME NQA 1 2000 Level ‘B’ warehouse conditions until issued for installation/use.”*

Parker is to include a shelf life statement with every purchase order indicating the shelf life date of each item (Catalog ID Number) on the purchase order.

Shelf life for every item shall be assigned by Parker under their quality assurance program and in accordance with industry (e.g., EPRI, Mil Spec, etc.) recommended shelf life values for similar components.

Shelf life can be determined by using EPRI Report: NP6408, Guidelines for Establishing, Maintaining and Extending the Shelf Life Capability of Limited Life Items (NCIG-13)

The OPG Receipt Inspector shall not accept the item for delivery if the remaining shelf life is less than 70% of the recommended shelf life at the time of delivery without prior written consent.

6.0 CERTIFICATION TO ACCOMPANY SHIPMENT

For each batch of O-rings/seals in a given shipment, Seals Unlimited shall supply a copy of the appropriate certificate originating from one of the Parker facilities audited by NUPIC and accepted by OPG.

Where this information is not provided by Parker, it should be appended by Seals Unlimited. The Quality Authority at Seals Unlimited shall sign and date this copy of the certificate and add his/her name and title together with a notation indicating that it is a “True copy” of the original. The certificate shall accompany the shipment of the O-ring/seal. This certificate shall be signed by Parker’s quality authority (AutoSignature is acceptable) at the manufacturing facility that produced the O-ring and shall certify that:

- The item has been manufactured in accordance with Parker’s QA program audited by NUPIC and accepted by OPG to the requirements of CSA CAN 3 Z299.3– 85 QA standard and the requirements of the purchase order.
- The item supplied meets the specifications for the indicated part number established by Parker for this compound.

The certificate shall also clearly indicate the following:

- Manufacturer’s name and part numbers
- Manufacturer’s unique identifier such as serial number, batch/lot control number or cure date/ manufacturer date (to ensure traceability)
- The business name and address of the Parker facility that produced the O-ring

The name and title of the quality authority at the NUPIC qualified Parker facility must appear below the signature and the approval date must be clearly evident.