

OSLC Change Management Version 3.0. Part 1: Specification

Committee Specification 01

08 June 2018

Specification URIs

This version:

http://docs.oasis-open.org/oslc-domains/cm/v3.0/cs01/part1-change-mgt/cm-v3.0-cs01-part1-change-mgt.html (Authoritative)

http://docs.oasis-open.org/oslc-domains/cm/v3.0/cs01/part1-change-mgt/cm-v3.0-cs01-part1-change-mgt.pdf

Previous version:

Latest version:

http://docs.oasis-open.org/oslc-domains/cm/v3.0/cm-v3.0-part1-change-mgt.html (Authoritative) http://docs.oasis-open.org/oslc-domains/cm/v3.0/cm-v3.0-part1-change-mgt.pdf

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This specification is one component of a Work Product that also includes:

- OSLC Change Management Version 3.0. Part 1: Specification (this document). http://docs.oasis-open.org/oslc-domains/cm/v3.0/cs01/part1-change-mgt/cm-v3.0-cs01-part1-change-mgt.html
- OSLC Change Management Version 3.0. Part 2: Vocabulary. http://docs.oasis-open.org/oslc-domains/cm/v3.0/cs01/part2-change-mgt-vocab/cm-v3.0-cs01-part2-change-mgt-vocab.html

Related work:

This specification is related to:

Open Services for Lifecycle Collaboration Change Management Specification Version 2.0. http://open-services.net/bin/view/Main/CmSpecificationV2

RDF Namespaces:

Standards Track Work Product

http://open-services.net/ns/cm#

Abstract:

This specification defines the OSLC Change Management domain, a RESTful web services interface for the management of product change requests, activities, tasks and relationships between those and related resources such as requirements, test cases, or architectural resources. To support these scenarios, this specification defines a set of HTTP-based RESTful interfaces in terms of HTTP methods: GET, POST, PUT and DELETE, HTTP response codes,

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content type handling and resource formats.

Status:

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Citation format:

When referencing this specification the following citation format should be used:

[OSLC-CM-3.0-Part1]

OSLC Change Management Version 3.0. Part 1: Specification. Edited by Jim Amsden. 08 June 2018. OASIS Committee Specification 01 http://docs.oasis-open.org/oslc-domains/cm/v3.0/cs01/part1-change-mgt/cm-v3.0-cs01-part1-changemgt.html. Latest version: http://docs.oasis-open.org/oslc-domains/cm/v3.0/cm-v3.0-part1-change-mgt.html.

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1. Introduction

This section is non-normative.

This specification defines the OSLC Change management domain as a RESTful web services interface for the management of product change requests, activities, tasks and relationships between those and related resources such as project, category, release and plan. To support these scenarios, this specification defines a set of HTTP-based RESTful interfaces in terms of HTTP methods: GET, POST, PUT and DELETE, HTTP response codes, content type handling and resource formats.

The intent of this specification is to define the capabilities needed to support integration scenarios defined by the Change Management Technical Committee and not to provide a comprehensive interface to Change Management. The resource formats and operations may not match exactly the native models supported by change management servers but are intended to be compatible with them. The approach to supporting these scenarios is to delegate operations, as driven by server contributed user interfaces, as much as possible and not require a server to expose its complete data model and application logic.

1.1 IPR Policy

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1.2 Terminology

Terminology uses and extends the terminology and capabilities of [OSLCCore3].

Change Request Resource

A request for change to an application or product. Typically a product request for enhancement, a report for a resolution of a product defect or simply a bug report.

Client

An implementation of the OSLC Change Management specifications as a client. OSLC CM Clients consume services provided by servers.

Server

An implementation of the OSLC Change Management specifications as a server. OSLC CM clients consume services provided by Servers. The use of the terms Client and Server are intended to distinguish typical consumers and providers of OSLC resources in a distributed environment based on REST. A particular application component could be a client for some OSLC domain services and a server for the same or another domain.

1.3 References

1.3.1 Normative references

[OSLCCore2]

S. Speicher; D. Johnson. <u>OSLC Core 2.0</u>. Finalized. URL: <u>http://open-services.net/bin/view/Main/OslcCoreSpecification</u> [OSLCCore3]

Jim Amsden; S. Speicher. <u>OSLC Core 3.0</u>. Committee Specification. URL: <u>http://docs.oasis-open.org/oslc-core/oslc-core/v3.0/oslc-core-v3.0-part1-overview.html</u>

[OSLCCoreVocab]

Jim Amsden; S. Padgett; S. Speicher. <u>OSLC Core Vocabulary</u>. Working Draft. URL: <u>http://docs.oasis-open.org/oslc-core/v3.0/oslc-core-v3.0-part7-core-vocabulary.html</u>

[OSLCResourcePreview]

Jim Amsden; S. Speicher. <u>OSLC Core 3.0 Resource Preview</u>. Draft. URL: <u>http://docs.oasis-open.org/oslc-core/oslc-core/v3.0/oslc-core-v3.0-part3-resource-preview.html</u>

[OSLCShapes]

Arthur Ryman; Jim Amsden. <u>OSLC Resource Shape 3.0</u>. URL: <u>http://docs.oasis-open.org/oslc-core/oslc-core/v3.0/oslc-core-v3.0-part6-resource-shape.html</u>

[OpenIDConnect1

OpenID Connect. URL: http://openid.net/connect/

[RFC2119]

S. Bradner. *Key words for use in RFCs to Indicate Requirement Levels*. March 1997. Best Current Practice. URL: https://tools.ietf.org/html/rfc2119

1.3.2 Informative references

[LDPPatch]

Linked Data Patch Format. Working Group Note. URL: http://www.w3.org/TR/ldpatch/

[OSLCActions]

Martin Pain; Steve Speicher. <u>Open Services for Lifecycle Collaboration Actions Specification Version 2.0</u>. Finalization. URL: http://open-services.net/wiki/core/Actions-2.0/

[OSLCCM20]

S. Speicher. <u>Open Services for Lifecycle Collaboration Change Management Specification Version 2.0</u>. Finalized. URL: http://open-services.net/bin/view/Main/CmSpecificationV2

[OSLCQM]

Paul McMahan. <u>Open Services for Lifecycle Collaboration Quality Management Specification Version 2.0</u>. Final. URL: http://open-services.net/bin/view/Main/QmSpecificationV2

[OSLCRM]

lan Green. *Open Services for Lifecycle Collaboration Requirements Management Specification Version 2.0*. Final. URL: http://open-services.net/bin/view/Main/RmSpecificationV2

1.4 Typographical Conventions and Use of RFC Terms

As well as sections marked as non-normative, all authoring guidelines, diagrams, examples, and notes in this specification are non-normative. Everything else in this specification is normative.

The key words must, must not, required, should, should not, recommended, may, and optional in this specification are to be interpreted as described in [RFC2119].

2. Base Requirements

The following sub-sections define the mandatory and optional requirements for an OSLC Requirements Management (OSLC RM) server.

2.1 Specification Versioning

This specification follows the specification version guidelines given in [OSLCCore3].

2.2 Namespaces

In addition to the namespace URIs and namespace prefixes oslc, rdf, dcterms and foaf defined in the [OSLCCore3], OSLC CM defines the namespace URI of http://open-services.net/ns/cm# with a namespace prefix of oslc_cm.

This specification also uses these namespace prefix definitions:

- oslc_rm:http://open-services.net/ns/rm#[OSLCRM]
- oslc_qm:http://open-services.net/ns/qm# [OSLCQM]

2.3 Resource Formats

In addition to the requirements for resource representations in [OSLCCore3], this section outlines further refinements and restrictions.

For HTTP GET requests on all OSLC CM and OSLC Core defined resource types,

- CM servers MUST provide Turtle and JSON-LD, and SHOULD provide RDF/XML and XML representations. The XML and JSON representations SHOULD follow the guidelines outlined in the OSLC Core Representations Guidance to maintain compatibility with [OSLCCore2].
- CM clients requesting RDF/XML should be prepared for any valid RDF/XML document. CM clients requesting XML SHOULD be prepared for representations that follow the guidelines outlined in the OSLC Core Representations Guidance.
- CM servers should support an [X]HTML representation and a user interface (UI) preview as defined by UI Preview **Guidance**

For HTTP PUT/POST request formats for resource type of ChangeRequest:

• CM servers MUST accept Turtle and JSON-LD representations and SHOULD accept RDF/XML and XML representations. CM servers accepting RDF/XML should be prepared for any valid RDF/XML document. For XML CM servers should be prepared for representations that follow the guidelines outlined in the OSLC Core Representations Guidance.

For HTTP GET response formats for Query requests,

CM servers MUST provide Turtle and JSON-LD, SHOULD provide RDF/XML, XML, and MAY provide Atom Syndication Format XML representations.

When CM clients request:

- text/turtle CM servers must respond with Turtle representation.
- application/ld+json CM servers must respond with JSON-LD representation.
- application/rdf+xml CM servers should respond with RDF/XML representation without restrictions.
- application/xml CM servers should respond with OSLC-defined abbreviated XML representation as defined in the OSLC Core Representations Guidance
- application/atom+xml CM servers should respond with Atom Syndication Format XML representation as defined in the OSLC Core Representations Guidance
- The Atom Syndication Format XML representation SHOULD use RDF/XML representation without restrictions for the atom:content entries representing the resource representations.

See Query Capabilities for additional information when Resource Shapes affect representation.

2.3.1 Content Negotiation

[OSLCCore3] specifies RDF representations (and specifically Turtle and JSON-LD) as a convention that all OSLC server implementations minimally provide and accept. OSLC CM server implementations are strongly encouraged to adopt this convention. Future versions of this specification are expected to require RDF representations for all operations and relax requirements for specialized XML representations.

XML Representation - identified by the application/xml content type. Format representation rules are outlined in Core OSLC Core Resource Formats section

RDF/XML Representation - identified by the application/rdf+xml content type. No additional guidance is given.

JSON-LD Representation - identified by the application/ld+json content type. Format representation rules are specified in JSON-LD 1.0.

Atom Syndication Format XML Representation - identified by the application/atom+xml content type. Format representation rules are outlined in Core OSLC Core Resource Formats section.

2.4 Authentication

[OSLCCore3] specifies the recommended OSLC authentication mechanisms. In addition to the OSLC Core authentication requirements, OSLC CM servers SHOULD support [OpenIDConnect].

2.5 Error Responses

[OSLCCoreVocab] specifies the OSLC Core error responses. OSLC CM puts no additional constraints on error responses.

2.6 Pagination

OSLC CM servers SHOULD support pagination of query results and MAY support pagination of a single resource's properties as defined by [OSLCCore3].

2.7 Requesting and Updating Properties

2.7.1 Requesting a Subset of Properties

A client MAY request a subset of a resource's properties as well as properties from a referenced resource. In order to support this behavior a server MUST support the oslc.properties and oslc.prefix URL parameter on a HTTP GET request on individual resource request or a collection of resources by query. If the oslc.properties parameter is omitted on the request, then all resource properties MUST be provided in the response.

2.7.2 Updating a Subset of Properties

A client MAY request that a subset of a resource's properties be updated by using the [LDPPatch] PATCH method.

For compatibility with [OSLCCore2], CM servers MAY also support partial update by identifying those properties to be modified using the oslc.properties URL parameter on a HTTP PUT request.

If the parameter oslc.properties contains a valid resource property on the request that is not provided in the content, the server MUST set the resource's property to a null or empty value. If the parameter oslc.properties contains an invalid resource property, then a 409 Conflict MUST be returned.

2.7.3 Updating Multi-Valued Properties

For multi-valued properties that contain a large number of values, it may be difficult and inefficient to add or remove property values. OSLC CM servers MAY provide support for a partial update of the multi-valued properties as defined by draft specification [LDPPatch]. CM servers MAY also support partial updates through HTTP PUT where only the updated properties are included in the entity request body.

2.8 Status, State and State Predicates

Probably the most important property of a Change Request is the status property. "Status" specifies the location of a Change Request in a workflow. The oslc_cm:status property is a typically read-only string that servers can set to describe the status of a ChangeRequest. In queries the oslc_cm:status property can be used to filter change request (e.g. all change requests that are "fixed") and may be used to perform state transitions (not part of this specification) on a change request, e.g. closing a change request as "fixed".

The problem is that different CM servers may use different properties (or even a set of properties) and different values to represent the change request's state. Even providing access to meta data does not help because knowing all possible state

values does not reveal the semantics of a state.

[OSLCCM20] introduced State Predicates to define single-value often read-only Boolean properties on a Change Request resource that allow servers to translate their specific status string values into a standard boolean state predicate value. An attempt to update read-only predicates **SHOULD** be answered with a 409 Conflict HTTP status code. Their presence in a resource representation used for an update via PUT MUST NOT prevent the resource from being updated. Predicates MUST be queryable. The Change Request resource definition sections defines the complete set of predicates.

OSLC CM 3.0 provides a similar means of defining a set of standard states that is also extensible. The oslc_cm:state property can have a value of type oslc_cm:state which represents an enumeration of individuals representing a standard set of ChangeRequest states. Servers MAY define additional individuals to extend the states of different ChangeRequest types and lifecycles.

2.9 Labels for Relationships

This section is non-normative.

Change Management relationships to other resources are represented by RDF properties. Instances of a relationship - often called links - are RDF triples with a subject URI, a predicate that is the property, and a value (or object) that is the URI of target resource. When a link is to be presented in a user interface, it may be helpful to display an informative and useful textual label instead of or in addition to the URI of the predicate and or object. There are three items that clients could display:

- The property: OSLC recommends using the rdfs:label property of the rdf:Property from the vocabulary to display the property.
- The value, or object of the triple: OSLC recommends using OSLC resource preview [OSLCResourcePreview] to obtain an appropriate icon and label, and possibly a small and/or large dialog for displaying the object.
- The link: The link is a combination of the subject, predicate and object of the triple (RDF statement or assertion). In the case where the link requires a unique label that is not available from the target resource, only then OSLC servers may support a determs: title on a reified statement to provide a label for a link that describes the assertion itself.

Turtle example using a reified statement:

```
@prefix ns0: <http://open-services.net/ns/cm#> .
@prefix rdf: <http://www.w3.org/1999/02/22-rdf-syntax-ns#> .
@prefix dcterms: <http://purl.org/dc/terms/> .

<http://example.com/bugs/4321> a <http://open-services.net/ns/cm#ChangeRequest> ;
    ns0:relatedChangeRequest <http://anotherexample.com/defects/123> .

<http://njh.me/#linkl> a rdf:Statement ;
    rdf:subject <http://example.com/bugs/4321> ;
    rdf:predicate ns0:relatedChangeRequest ;
    rdf:predicate ns0:relatedChangeRequest ;
    rdf:object <http://anotherexample.com/defects/123> ;
    dcterms:title "Defect 123: Problems during install" .
```

JSON-LD example using reified statement:

```
EXAMPLE 2

{
    "@context": {
        "dcterms": "http://purl.org/dc/terms/",
        "rdf": "http://www.w3.org/1999/02/22-rdf-syntax-ns#",
        "oslc": "http://open-services.net/ns/core#",
        "oslc_cm": "http://open-services.net/ns/cm#"
    },
        "@id": "http://example.com/bugs/4321",
        "@id": "oslc_cm:ChangeRequest";
        "oslc_cm:relatedChangeRequest": {
        "@id": "http://anotherexample.com/defects/123",
        "dcterms:title": "Defect 123: Problems during install"
    }
}
```

3. Vocabulary Terms and Constraints

OSLC Change Management Version 3.0. Part 2: Vocabulary Defines the vocabulary terms and constraints for OSLC Change Management resources. These terms and constraints are specified according to [OSLCCoreVocab].

4. CM Server Capabilities

4.1 Server Resources

OSLC CM servers **MUST** support OSLC Discovery capabilities defined by [OSLCCore3].

OSLC CM servers MAY provide a ServiceProvider Resource that can be retrieved at a implementation dependent URI.

OSLC CM servers MAY provide a ServiceProviderCatalog Resource that can be retrieved at a implementation dependent URI.

OSLC CM servers MAY provide a oslc:serviceProvider property for their defined resources that will be the URI to a ServiceProvider Resource.

OSLC CM servers must supply a value of http://open-services.net/ns/cm# for the property oslc:domain on either oslc:Service Or oslc:ServiceProviderCatalog resources.

OSLC CM servers MAY allow ChangeRequest state change through [OSLCActions].

4.2 Creation Factories

OSLC CM servers MUST support <u>Creation Factories</u> and list them in the Service Provider Resource as defined by OSLC Core. OSLC CM servers <u>SHOULD</u> support Resource Shapes for Creation Factories as defined in [OSLCShapes]

4.3 Query Capabilities

OSLC CM servers should support the Query Capabilities as defined by [OSLCCore3]. OSLC CM servers should support Resource Shapes for Query Capability as defined in [OSLCShapes]

The Query Capability, if supported, MUST support these parameters:

- oslc.where
- oslc.select
- oslc.properties
- oslc.prefix

If shape information is NOT present with the Query Capability, servers SHOULD use these default properties to contain the result:

- For RDF/XML and XML, use rdf:Description and rdfs:member as defined in OSLC Core RDF/XML Examples.
- For JSON, the query results are contained within oslc:results array. See OSLC Core Representation Guidance for JSON

4.4 Delegated UIs

OSLC CM servers MUST support the selection and creation of resources by delegated web-based user interface dialogs Delegated UIs as defined by [OSLCCore3].

OSLC CM servers MAY support the pre-filling of creation dialogs based on the definition at Delegated UIs.

4.5 Usage Identifiers

An OSLC CM server can identify or distinguish the usage of various services with additional property values for the OSLC Core defined oslc:usage property on oslc:Dialog, CreationFactory and QueryCapability. The oslc:usage property value of http://open-services.net/ns/core#default will be used to designate the default or primary service to be used by clients when multiple entries are found.

The additional Change Management property values for oslc:usage are:

- http://open-services.net/ns/cm#defect primarily used by QM tools to report defects in testing.
- http://open-services.net/ns/cm#planItem used by QM and PPM tools for associating change requests into plans (project, release, sprint, etc).
- http://open-services.net/ns/cm#task used by QM and PPM tools for associating change requests into executable and track-able items.
- http://open-services.net/ns/cm#requirementsChangeRequest used by RM tools for associating a change request for usage in tracking changes to a Requirements resource

5. Conformance

This specification is based on [OSLCCore3]. OSLC CM servers MUST be compliant with both the core specification, MUST follow all the mandatory requirements in the normative sections of this specification, and SHOULD follow all the guidelines and

recommendations in both these specifications.

An OSLC CM server MUST implement the domain vocabulary defined in OSLC Change Management Version 3.0. Part 2: Vocabulary

The following table summarizes the requirements from OSLC Core Specification as well as some additional requirements specific to the CM domain. Note that this specification further restricts some of the requirements for OSLC Core Specification. See the previous sections in this specification or the OSLC Core Specification to get further details on each of these requirements.

Number	Requirement	Level	Meaning			
CM-1	Unknown properties and content	MAY / MUST	OSLC servers MAY ignore unknown content and OSLC clients MUST preserve unknown content			
CM-2	Resource Operations	MUST	OSLC service MUST support resource operations via standard HTTP operations			
СМ-3	Resource Paging	MAY	OSLC servers MAY provide paging for resources but only when specifically requested by client			
CM-4	Partial Resource Representations	MAY / MUST	OSLC servers MUST support request for a subset of a resource's properties via the oslc.properties URL parameter retrieval via HTTP GET			
CM-5	Partial Update	MAY	OSLC servers MAY support partial update of resources using [LDPPatch], or via HTTP PUT.			
CM-6	Discovery	MUST / MAY / SHOULD	OSLC servers SHOULD provide a ServiceProvider resource for Core v2 compatibility provide a ServiceProviderCatalog, and MAY provide other forms of discovery descri in Core 3.0 Discovery.			
CM-7	Creation Factories	MUST	OSLC servers MUST provide LDPC creation factories to enable resource creation of Change Management resources via HTTP POST			
CM-8	Query Capabilities	SHOULD	OSLC servers SHOULD provide query capabilities to enable clients to query for resources			
CM-9	Query Syntax	SHOULD / MAY	OSLC query capabilities SHOULD support the OSLC Core Query Syntax and MAY use other query syntax			
CM-10	Delegated UI Dialogs	MUST / SHOULD	OSLC Services MUST offer delegated UI dialogs (creation and selections) specified via OSLC Core 3.0 Delegated Dialogs and SHOULD include discovery through a ServiceProvider resource for OSLC v2 compatibility			
CM-11	UI Preview	SHOULD	OSLC Services SHOULD offer UI previews for resources that may be referenced by other resources specified via OSLC Core 3.0 Preview and SHOULD include discovery through a server resource for OSLC v2 compatibility			
CM-12	Authentication	MAY	OSLC Services SHOULD follow the recommendations for Authentication specified in [OSLCCore3]			
CM-13	Error Responses	SHOULD	OSLC Services SHOULD provide error responses using OSLC Core 3.0 defined error formats			
CM-14	Turtle Representations	MUST	OSLC servers MUST provide a Turtle representation for HTTP GET requests and SHC support Turtle representations on POST and PUT requests.			
CM-15	RDF/XML Representations	SHOULD	OSLC servers SHOULD provide an RDF/XML representation for HTTP GET requests SHOULD support RDF/XML representations on POST and PUT requests for compatib with Change Management 2.0.			
CM-16	XML Representations	SHOULD	OSLC servers SHOULD provide a XML representation for HTTP GET, POST and PUT requests that conform to the Core 2.0 Guidelines for XML.			
CM-17	JSON Representations	MUST	OSLC servers MUST provide JSON-LD representations for HTTP GET, POST and PUT requests that conform to the Core Guidelines for JSON-LD			
CM-18	HTML Representations	SHOULD	OSLC servers SHOULD provide HTML representations for HTTP GET requests			

Appendix A. Version Compatibility with 2.0 Specifications

A.1 Deprecated terms

A number of terms introduced in early development of the OSLC Change Management domain were deprecated in the finalized [OSLCCM20] specification. These terms are summarized here in order to indicate they remain deprecated.

Prefixed Name	Occurs	Read-only	Value- type	Represen- tation	Range	Description
deprecated dcterms:type	zero- or- more	unspecified	String	n/a	n/a	A short string representation for the type, example Defect.
Relationship properties: This grouping of properties are used to identify relationships between resources managed by other OSLC servers						
deprecated oslc_cm:testedByTestCase	zero- or- many	False	Resource	Reference	any	Test case by which this change request is tested. It is likely that the target resource will be an oslc_qm:TestCase, but that is not necessarily the case.
deprecated oslc_cm:affectsTestResult	zero- or- many	False	Resource	Reference	any	Associated QM resource that is affected by this Change Request. It is likely that the target resource will be an oslc_qm:TestResult, but that is not necessarily the case.
deprecated oslc_cm:blocksTestExecutionRecord	zero- or- many	False	Resource	Reference	any	Associated QM resource that is blocked by this Change Request. It is likely that the target resource will be an oslc_cm:TestExecutionRecord, but that is not necessarily the case.
deprecated oslc_cm:relatedTestExecutionRecord	zero- or- many	False	Resource	Reference	any	Related to a QM test execution resource. It is likely that the target resource will be an oslc_qm:TestExecutionRecord, but that is not necessarily the case.
deprecated oslc_cm:relatedTestCase	zero- or- many	False	Resource	Reference	any	Related QM test case resource. It is likely that the target resource will be an oslc_qm:TestCase, but that is not necessarily the case.
deprecated oslc_cm:relatedTestPlan	zero- or- many	False	Resource	Reference	any	Related QM test plan resource. It is likely that the target resource will be an oslc_qm:TestPlan, but that is not necessarily the case.
deprecated oslc_cm:relatedTestScript	zero- or- many	False	Resource	Reference	any	Related QM test script resource. It is likely that the target resource will be an oslc_qm:TestScript, but that is not necessarily the case.

A.2 Changes from 2.0

The following lists the significant vocabulary changes that were introduced in this specification. The changes are all upward compatible additions and therefore do not introduce incompatibilities with version 2.0.

- Added oslc_cm:priority and oslc_cm:severity
- Added new change management types

Appendix B. Acknowledgements

This section is non-normative.

The following individuals have participated in the creation of this specification and are gratefully acknowledged:

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Appendix C. Change History

This section is non-normative.

Revision	Date	Editor	Changes Made
01	08/06/2018	Jim Amsden	Committee Specification 01 Published