



**Simulation Interoperability
Standards Organization**

"Simulation Interoperability & Reuse through Standards"

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Reference for Standards Activities Committee Special Working Group Enumerations for Simulation Operations Manual

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Prepared by:

**Standards Activity Committee Special Working Group
Reference for Enumerations for Simulation
(SAC SWG Enumerations)**

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Revision History

Version	Section	Date (MM/DD/YYYY)	Description
SISO-REF-010.1-DRAFT	All		Updated entire document to new format
SISO-REF-010.1-2018	7.3 7.5.2.1 7.5.2.6 8.2 8.3.2.5	27 April 2018	Add additional information on Platform Kind and add information on Supply Class update. Added the (Retired) description for the word generations step, to identify the Retired entries.
SISO-REF-010.1-2017	2.1 7.5.1.2d	21 August 2017	Update the OPMAN to reference SISO-REF-056. Best Practice 11-8: Each instance XML document to include schemas SHALL utilize UTF-8 encodings.
SISO-REF-010.1-2016	All	5/26/2016	Added text on acronym deletion per CR3222. Add UID reference and new section per CR3284. Add “informative” text in CRs per CR3265. Add clarification on foreign language characters per CR3286. Updated for new name of group: SWG for Enumerations. The group maintaining this document and SISO-REF-010 is now organized under the SAC and not the DIS PSG and the document and group names have changed. Reordered revision history.
SISO-REF-010.1-2015	All	12/23/2014	Added 7.4.5 for a clarification on Uniquely Identified Entity Types (CR03004); added terms for deprecated, transferred, and variation (CR03087); identified the color scheme (CR03088); updated approval process (CR03089)
SISO-REF-010-01v2-0	All	11/18/2013	Removed draft number, deleted draft history. Major changes in this version: clarify miscategorization and Base ID/UUID, changed “commissioned” to “launched,” removed “replaced,” added capitalization guidelines, style guide adherence, version number changes, added implicit entity type definition and section.
SISO-REF-010.1-2011	All	04/05/2011	Initial release, approved by EXCOM

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1 Introduction

The SISO Standards Activities Committee (SAC) created the Special Working Group (SWG) Enumerations with the responsibility to manage SISO-REF-010, the Enumerations for Simulation Interoperability document. SISO-REF-010 is an important resource for the entire simulation community.

The following information is provided for the convenience of users of this product and does not constitute an endorsement by SISO of these products.

Several Microsoft™ products and their formats are specifically referenced herein. Although some of these formats and products may be supported or used, respectively, they are not the only options provided.

1.1 Purpose

This document is an operations manual (OPMAN) and identifies the nature of this SWG, its processes and policies, and other guidelines involving the management of enumerations. Note that SISO-REF-010 is an unballoted product and therefore SISO-ADM-003 Balloted Products Development and Support Process (BPDSP) doesn't apply to this effort. The SISO P&P document (SISO-ADM-002) provides one definition of a reference document as a "data dictionary," and it is this definition under which the working group feels that the enumerations reside. SISO-REF-010 is essentially a data dictionary for distributed simulation.

1.2 Scope

This document applies only to the SAC SWG Enumerations and not to any other groups at SISO. The SAC SWG Enumerations group is defined as every SISO member belonging to the enumerations reflector (SAC-SWG-ENUM).

1.3 Objectives

The objective for this document is to define a consistent and forward-looking process and organization to capture, review, and approve enumerations for distributed simulation.

1.4 Intended Audience

This document applies to anyone interested specifically in SISO-REF-010 and in general anyone interested in distributed simulation or interoperability, thus hopefully becoming interested in SISO-REF-010.

2 References

2.1 SISO Documents

The following SISO documents were used in generating the policies and procedures defined herein. When the following documents are superseded by an approved revision and that causes a conflict with this document, the revision of the below-referenced documents shall supersede this document. These documents are available through the SISO web site at <https://www.sisostds.org/>.

Document Number	Title
SISO-ADM-001-2018	Policy for Product Identification
SISO-ADM-002-2017	SISO Policies & Procedures
SISO-ADM-005-2011	Policy for: The Style and Format of SISO Documents
SISO-REF-056-2018	SISO Reference for XML Style Guide

2.2 Other Documents

Document Number	Title
IEEE Std 1278.1-2012	IEEE Standard for Distributed Interactive Simulation—Application Protocols
RFC 4122	A Universally Unique IDentifier (UUID) URN Namespace http://www.ietf.org/rfc/rfc4122.txt

3 Definitions

3.1 General Enumeration Definitions

The following terms are used to make it easier to discuss and define requirements related to all enumerations.

Term	Definition
Description	With respect to the enumerations in SISO-REF-010, this refers to the descriptive phrase or title assigned to each enumeration. For example, the German entity type enumeration 1.3.78.6.1.1.0 is "F 215 Brandenburg."
Deprecated	This attribute indicates that this enumeration is superseded by another entry, or otherwise rendered obsolete. The existing value is used at risk, with the understanding that other simulation applications are using the correct, updated enumeration. A deprecated entity type points to the correct enumeration, if known, via the base ID attribute.
Transferred	This attribute indicates that the uniquely identified entity type has been reassigned (transferred) to a different country code. A transferred entity type points to the new enumeration via the base ID attribute. Note that a platform can be transferred multiple times, with each one pointing to the next country code change.
Variation	This attribute indicates that the entity type is a country-specific variant of a recurrent entity type from a different country code. The base ID attribute is set to the recurrent entity type from which this variant originates.

3.2 Entity Type Enumeration Terminology

The following terms are used to make it easier to discuss and define requirements related to entity type enumerations.

Term	Definition
Assigned Enumeration	An entity type enumeration value that has been permanently assigned for use in one of the seven fields that make up the Entity Type record. It is permanently assigned because it is either specified in the DIS Standard or has been approved through the enumeration change request process. These enumerations are used as part of the schema to define an entity type to help group together entity types. When a given kind and domain has a field containing assigned enumerations, all the enumerations in that field are assigned enumerations. Examples are all of the enumerations contained in the Kind, Domain, and Country fields for the Entity Type record. The Category, Subcategory, and Specific fields may also have assigned enumerations depending on the Kind field value. Examples include the Attack/Strike Category field value for air platforms and the Tank Category for land platforms.
Designation	Regarding entity types, this is any alphanumeric label assigned by a manufacturer, government or other organization (such as the North Atlantic Treaty Organization [NATO]) to a model or model variation.

Term	Definition
Implicit Entity Type	An Entity Type that is not explicitly enumerated in SISO-REF-010. The Entity Type is instead composed from several tables that cannot be altered by simple changes to the comprehensive Entity Type table. An example is a "U.S. Container Ship." The Container ship is a Subcategory (3) of the Dry Cargo Ship Category (81) and therefore for the U.S. country code, the implicit Entity Type would be 1.3.225.81.3. This enumeration type will not appear under the "United States Surface Platforms" section in the SISO-REF-010 until a CR is submitted and approved to add a specific hull for a type of commercial dry cargo container ship to the U.S country code.
Recurrent Entity Type	An entity type that represents an object where the same entity type may be associated with multiple entities that are present in an exercise at the same time. Typically, this represents a model or model variation of some object for which multiple copies are manufactured. Each copy is produced to the same basic specification and has the same basic functionality (e.g., the Airbus Model 380 aircraft.) It is identified in the entity type description as only a model or model variation (e.g., M1A1 Abrams tank) or as a generic object (e.g., a lighthouse) for which many may exist. During an exercise, many entities may have the same recurrent entity type in the Entity Type field of the Entity State Protocol Data Unit (PDU) (e.g., many Eurofighters may be airborne at the same time and flying missions.)
Uniquely Identified Entity Type	An entity type enumeration that together with its title/description uniquely identifies an entity as being distinct from all others. A common use is for naval ships. A number of frigates may be designed and built by a country to the same general specification and their appearance and performance may be similar. They will have a recurrent entity type assigned to that class of ship. In addition, as each ship is built and launched for that class, the navy of that country assigns a specific hull number and name to uniquely identify each individual ship. When a CR is submitted to add an entity type that identifies a specific ship by name and hull number, this becomes a uniquely identified entity type. There are no other ships in the world that have the same entity type identification. During an exercise it would be expected that a uniquely identified entity type would only be assigned to one entity as there is really only one physical object in the world with that unique identification. So, a uniquely identified entity type may be derived from a recurrent entity type or may represent an object for which only one was ever created (e.g., the Eiffel Tower.) In summary, it is the way an entity type enumeration can be used to uniquely identify an individual entity.

4 Acronyms and Abbreviations

Acronym/Abbr	Definition
BPDSP	Balloted Products Development and Support Process
CA	Closed - Approved
CJ	Closed - Rejected
CR	Change Request
DIS	Distributed Interactive Simulation
ELNOT	Electronic Intelligence Notation
HLA	High-Level Architecture
ID	Identification
IEEE	Institute of Electrical and Electronics Engineers
NATO	North Atlantic Treaty Organization
OP	Open - Pending
OA	Open - Approved
OH	Open - Hold
OPMAN	Operations Manual (this document)
PCR	Problem / Change Request
PDG	Product Development Group
PDU	Protocol Data Unit
PSG	Product Support Group
RA	Recommend - Approved
RJ	Recommend - Rejected
RH	Recommend - Hold
RW	Recommend - Working
SAC	Standards Activity Committee
SISO	Simulation Interoperability Standards Organization
SWG	Special Working Group
TENA	Test and Training Enabling Architecture
XML	Extensible Markup Language
XSD	XML Schema Definition
XSLT	Extensible Stylesheet Language Transformations

5 SAC SWG Enumerations Organization

5.1 Responsibilities

The SWG Enumerations is responsible for maintaining SISO-REF-010 and publishing it to the distributed simulation community at large through the established SISO processes in section 9.1.2 of the SISO Policies and Procedures document.

5.2 Membership

5.2.1 Officers

The only officer is the SWG Enumerations Lead. When open, this position shall be filled via the normal process for the execution of SAC special working groups. The officer has responsibility to ensure that the SISO Enumerations webpage is maintained:

<https://www.sisostds.org/StandardsActivities/StandardsActivityCommittee/SACSWGEnumerations.aspx>

5.2.2 Voting Members

Any SISO members subscribed to the SAC-SWG-ENUM reflector shall be voting members. No minimum quorum is defined for voting.

5.2.3 Non-Voting Members

Members of the SWG Enumerations who are not also members of SISO may not vote. Such members may join the reflector as alumni of SISO or by special invitation as subject matter experts, or for other reasons regarding coordination with SISO committees.

5.3 E-Mail Reflector

There is only one reflector for enumerations use: SAC-SWG-ENUM. This is the primary method of communication and is used for all announcements, CR submissions, and discussions. The reflector is also accessible via the web interface (and may be used as a web forum rather than e-mail reflector).

5.4 Liaison with Distributed Simulation Stakeholders

As noted previously, the enumerations are important for the entire distributed simulation community, including most notably High-Level Architecture (HLA) (particularly with the RPR FOM or derivatives), Distributed Interactive Simulation (DIS), and the Test and Training Enabling Architecture (TENA). It is important to maintain a liaison with these other distributed simulation communities because in many cases those architectures and standards use the enumerations found in SISO-REF-010. It is recommended that at least one member of the SWG Enumerations belongs to each noted community.

6 Approval Processes

Figure 1 diagrams the flow of the SWG Enumerations product approval process. This process has three major parts: CR Review & Status, CR Block & Release Candidate, and SISO Approval. Also identified are the status values for the CRs as they progress through the workflow. These status values are detailed below. CRs apply to all products, including the main enumerations, the schema, and OPMAN. Anything that is not automatically generated (enumerations) is submitted as a manual CR (e.g., schema or OPMAN changes).

It is expected that this schema will be widely used by consumers of the enumerations in SISO-REF-010, and so it is imperative to establish an approval process for changes to the schema. Such changes will affect a wide variety of people and can significantly affect their simulation systems.

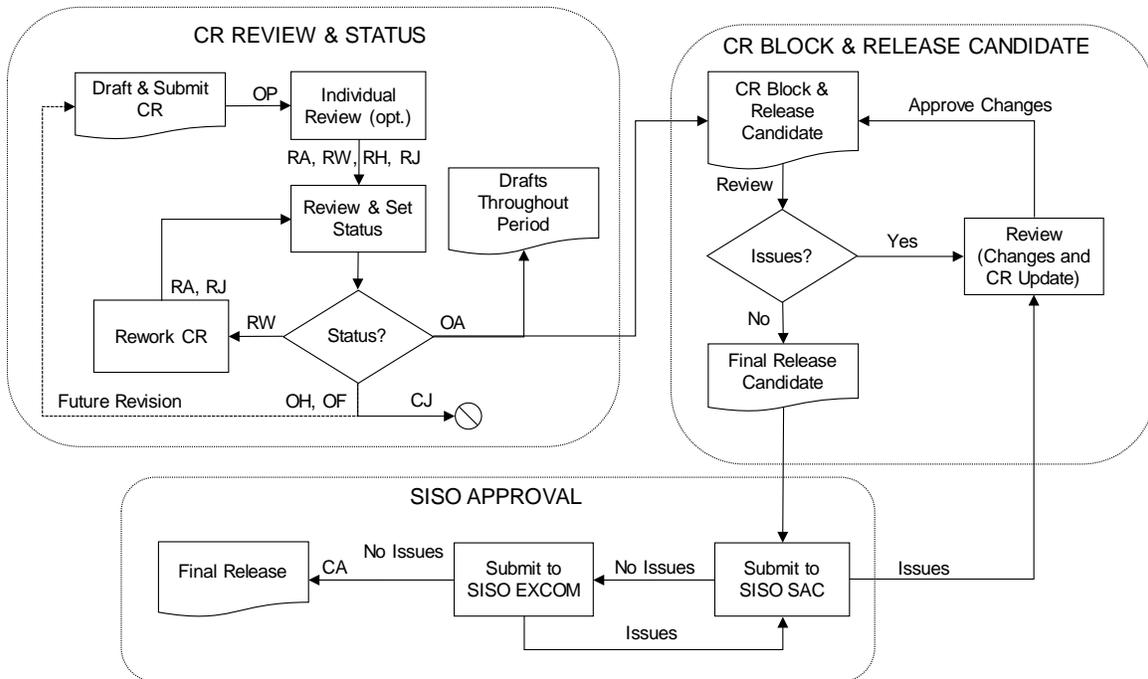


Figure 1: SWG Enumerations Approval Process

CRs will be given one of the following status descriptions, which are noted in the workflow diagram:

- Open - Pending (OP)** – This CR has been submitted and assigned a CR number but has not been reviewed by the SWG Enumerations.
- Open - Approved (OA)** – This CR has been approved as a candidate to go into the next release.
- Open - Hold (OH)** – This CR has been placed on hold for the reason(s) cited in the Comments section. Typically, this CR will be worked in a future version, but may be worked at any time and reopened as one of the other recommendations.
- Open - Future (OF)** – This CR has been placed on hold for future usage – the entity is not launched (if unique) or not available (recurrent).
- Closed - Approved (CA)** – This CR has been approved and incorporated into an official release.
- Closed - Rejected (CJ)** – This CR has been rejected for the reason(s) cited in the Comments section (e.g., withdrawn, duplicate, preexisting, merged).
- Recommend - Approved (RA)** – This CR has been reviewed and recommended to be approved for the reason(s) cited in the Comments section.
- Recommend - Rejected (RJ)** – This CR has been reviewed and recommended to be rejected for the reason(s) cited in the Comments section.
- Recommend - Hold (RH)** – This CR has been reviewed and recommended to be placed on hold for the reason(s) cited in the Comments section.

- j) **Recommend - Working (RW)** – This CR has been reviewed and recommended to be reworked for the reason(s) cited in the Comments section. The CR may transition to approval or rejection.

6.1 CR Review & Status

As members generate change requests throughout the period, they submit them to the SWG Enumerations. Other members then review the submissions. Changes may be made and resubmitted. It is at this point of first review that the CRs are given an initial individual review status (optional, recommendations by one or more members), reviewed by the SWG Enumerations (required), and given a disposition status. The SWG Enumerations is never under any obligation to follow the individual recommendation. The diagram above illustrates that CRs that undergo rework normally are set to RA upon completion (otherwise the rework would not be necessary), but it is possible to provide different recommendations following rework.

The following are the steps to follow for CR Review & Status:

- a) All new CRs shall be posted to the enumerations reflector. For details on how to do this, see 8.2.1.
- b) All CRs are subject to review by the SWG Enumerations as a whole. Anyone in the SWG Enumerations may post comments, questions, or recommendations at any time (except for approved CR block, see 6.2).
 - 1) Because the SWG Enumerations needs to support the case where the originator can no longer be found, anyone in the SWG Enumerations may revise a CR, even if the CR is not originally written by that person. This should be done with approval or concurrence of the original author, however, if at all possible. It is not to be used as an attempt to circumvent the originator's submission. Note that the automated process receives these updates, so do not send example revisions to the reflector using the normal submission process (when discussing changes, simply copying comments in an e-mail or forum post rather than the specifically named file would be a better option).
 - 2) Any particular CRs may be put on hold by the SWG Enumerations Lead or by consensus of the SWG Enumerations for further review or a vote. If consensus cannot be obtained, then the issue shall be put up for an electronic vote or gets put on hold by nature of the failure of consensus. It is critical that the liaison personnel identify issues that may impact their areas of communication, and potentially recommend that certain issues be put on hold, or not (some might desire expedition).
 - 3) If a CR modifies values in an IEEE or SISO standard then that CR requires approval of a Problem / Change Request (PCR) (or similar document), and the CR shall be placed in either Open – Hold (OH) or Recommend – Working (RW) status until such time as the PCR is approved by the authoritative group. Note that CRs in RW status are not published in the draft, which might be a more suitable option for some incompatible or controversial changes.
- c) Once reviewed by the group, CRs in RW must be reworked and re-reviewed at some later date. Only approved CRs in Open – Approved (OA) status are passed for inclusion in the draft and release candidate. CRs in Closed – Rejected (CJ) status are including in the change block for formal notice. These CRs do not alter the draft or release candidate.
 - 1) To be considered for a particular period, a CR must be submitted in, or prior to, that period. The end of a period is a hard cutoff date for any CR. The period is defined per version and depends on the ability of the group volunteers to support. During a telecon or face-to-face meeting, the group defines the cutoff date for a change block at least two calendar weeks prior.
 - 2) Approval by the SWG Enumerations shall be done on the CRs during the SWG Enumerations Review, not the draft. While the draft may be used to review the CRs, it is critical to understand that SWG Enumerations members are approving the individual CRs.
 - 3) CRs on hold for more than a year for reasons other than coordinating with external standards may be closed (rejected) because the items are overcome by events (OBE) or the submitter has lost interest and there is no longer a champion for that CR.

6.2 CR Block & Release Candidate

The release candidates are generated from a block of the approved CRs. The SWG Enumerations reviews these drafts and the CR block. Any necessary CR changes go back through SWG Enumerations review for edit and re-approval of the individual, respective CR. The initial review of the CR Block and release candidate shall be open for a minimum of five days. Further review after CR updates may be shorter; for example, it may be held at a single telecon.

The CR Block is officially formed by separating the noted CRs in a separate tab of the CR Status sheet. The CRs are moved from the Current tab to the new CR block tab (named appropriately for that revision). The CRs are not physically moved from the repository and compiled into a CR Block archive on the Digital Library until after the revision has been approved by the EXCOM. Note that issues in the CR Block or final draft may simply be administrative, document template, or toolset changes and not CR updates, but all such issues are noted and reviewed by the SWG Enumerations. Every release candidate review of SISO-REF-010 and the OPMAN is effectively release validation by the SWG Enumerations. When no more issues are found, then that last draft is re-marked for submission to the SAC as a final draft release in accordance with SISO-ADM-001.

The following are the steps to follow for CR Block & Release Candidate:

- a) The Lead or Editor forms the CR block and updates the CR Status file for the current version.
 - 1) CRs in an approved CR block may only be updated if the changes are administrative (typically only for automated processing), or by SWG Enumerations approval for a technical change prior to the change taking place. We do not want continuous CR updates of the block of CRs currently being used to generate the final drafts.
- b) The Editor produces the release candidate and publishes it to the reflector (either directly or as a link from the digital library).
- c) The SWG Enumerations reviews and approves the release candidate. Changes require subsequent release candidates and re-review and approval by the SWG Enumerations.
- d) The Editor generates the final draft for submission to the SAC.
- e) Per normal document review process in SISO-ADM-002, the SAC then submits the final draft to the EXCOM for approval. Changes, if any, then flow back to the SAC and to the group for incorporation.
- f) After final approval by the EXCOM, the release is generated with the appropriate changes in wording (e.g., marked Approved and with approval dates).
 - 1) The Editor creates the change block file in the digital library and deletes the closed CRs from the repository.
 - 2) The Editor generates the final release, with review by the Lead, and submission to the SAC Secretary for publishing the products folder of the digital library.
 - 3) A note is sent by the SAC Secretary to the help desk for updating the appropriate web pages.
 - 4) CRs previously marked OA in this release in the CR Status file are now marked CA.

6.3 SISO Approval

The SAC and EXCOM review and approve the next release of SISO-REF-010 and SISO-REF-010.1 according to SISO-ADM-002. Issues noted by the SAC are immediately returned for fixing by the SWG Enumerations. Issues noted by the EXCOM are likely returned to the SAC, which may then be returned to the SWG Enumerations or fixed directly. Administrative issues (e.g., typo in a copyright statement, updates to comply with SISO policy) may be addressed directly by the Lead or designate in accordance with SAC or EXCOM direction. Once EXCOM approves the documents, they are released in accordance with SISO-ADM-001. All CRs in the block that were in the OA state are transitioned to the CA state.

The following are the steps to follow for SISO Approval:

- a) The Lead submits the final draft package to the SAC for approval.
- b) If the SAC has edits prior to approving, then those changes are submitted back to the SWG Enumerations for incorporation and possible re-review.
 - 1) Administrative changes are not subject to approval by the SWG Enumerations.
 - 2) The Lead then re-submits the new final draft to the SAC.

7 Enumerations

7.1 Unique Identifiers

The XML database contains two types of unique identifiers: the universally unique identifier (UUID) and the unique identifier (UID). The UUID is described in RFC 4122, "A Universally Unique IDentifier (UUID) URN Namespace." This is a 128-bit value assigned to every enumeration and can be referenced globally without context. When users submit UUIDs for entries in the SISO-REF-010 product, it is recommended using the randomly generated version (4). The UID is a positive integer that identifies the tables, Entity Types, and Object Types. A value of 0 is not yet defined for UID. Values 1 through 8,999 are reserved for tables; values 10,000 and above are reserved for Entity Types and Object Types (in any order, preferably without gaps); values 9,000-9,999 are reserved for local Entity Types and Object Types established between a host and image generator (IG) (or for similar use cases) and will not be allocated by SISO-REF-010.

7.2 General Guidelines and Rules

The following define general guidelines and rules regarding enumerations:

- a) **Notation:** When identifying entity type enumerations not in tabular form, then it is recommended to use the notation of the septuplet separated by periods, not hyphens or spaces or other punctuation. Also, do not use leading zeroes. Any zeroes at the end of the septuplet may be left out, but the meaning for that usage is that you are discussing that particular entity and all of its potential children. For example, the Stryker Mobile Gun System is 1.1.225.2.5.22.0, but if you leave out the last zero (for the Extra field) then that would also include all potential variants of this entity in the discussion. Object type enumerations use a similar notation.
- b) **Acronyms:** Any CR containing an acronym shall be compared to the present list of acronyms in the most recent draft SISO-REF-010. If the acronym is not presently listed, then it shall be included, along with its definition, as a different CR. With coordination, one CR may be used to accumulate all the acronyms for a particular revision of SISO-REF-010.
- c) **Deprecation Guidelines and Rules:**
 - 1) If an enumeration is deprecated, the description of the enumeration shall not be removed. Instead, the enumeration shall be clearly identified as deprecated. For the machine readable form, the deprecated attribute is set to true. For any translated or printed forms (e.g., Microsoft Word™ document), the description of the enumeration is annotated with the term "(deprecated)."
 - 2) Enumerations shall not be deleted, even if marked as deprecated for some time. Instead, they are marked for deprecation and never reused, though an enumeration could eventually be reverted from deprecation given sufficient justification. Exceptions that allow deletion are very rare, but may be made with concurrence of the SWG Enumerations, and examples of why this would occur are given below:
 - i. A schema change or schema record deletion. The schema itself should not be littered with changes as this would get very confusing.
 - ii. Copyrighted, trademarked, or patented text deletion cannot be deprecated. The very reason for the deletion requires that it not be retained. An example of these are records that get incorporated into an IEEE standard.
 - iii. Enumerations that are determined to be classified material (by themselves or by aggregation) or that otherwise fall under restricted distribution rights even if not classified.
 - 3) Entity type enumerations shall not be deprecated for entities that are no longer in service or inactive. Such entity types are still valid for legacy (replay) and historical purposes.
 - 4) The acronym enumerations, records, and bitfields shall allow deletion and not deprecation. These are not enumerations and are intended to reflect current, accurate information.

- d) The addition of an Entity Type enumeration shall be for a real-world entity that exists or has existed (historical simulations are supported). Entities that are in the planning stage, or uniquely identified entities that have not yet been launched, shall not be considered for inclusion. The rationale for this rule is because there are many of these planned entity types that either never come to fruition or end up with a different name or different specification that would cause an entity type change. For simulation applications that still require these systems for implementation, the recommendation is a locally updated or extended enumeration set. Such entries can be still submitted to the SWG Enumerations, however, and given an OF status so that the enumerations can be reserved and deconflicted with other entries. This method also will show them in a draft.
- e) **Capitalization:** Capitalize the first and last words of the enumeration and all nouns, pronouns, adjectives, verbs, adverbs, and subordinating conjunctions (if, because, as, that, and so on). Articles (a, an, the), coordinating conjunctions (and, but, or, for, nor), and prepositions, regardless of length, are lower-cased unless they are the first or last word of the enumeration.
- f) **Retired Guidelines and Rules:** A uniquely defined entity type shall only be marked as retired when it has officially and publicly been decommissioned. The comments in the CR for this retirement should provide supporting documentation of publicly accessible links.

The standard notations that are defined elsewhere in this document are listed below for convenience, and may pertain to specific enumeration types:

- (transferred) – applies only to Entity Type enumerations and indicates that a uniquely identified entity type now belongs to another country code (see 7.4.1.3).
- (variation) – applies only to Entity Type enumerations and indicates that this entity is a specific country code variant of a recurrent entity type (see 7.4.1.4).
- (deprecated) – applies to all enumerations (see earlier in this section). See 7.4 for specific rules regarding Entity Type enumerations.
- (retired) – applies on to Entity Type enumerations and indicates that a uniquely identified entity type has been retired or decommissioned.

7.3 Protected Enumerations

There are several enumerations and enumeration fields in SISO-REF-010 that are considered protected. The enumerations are specifically identified as protected in the machine readable file by using an XML attribute. For details on the implementation of this, please refer to the schema.

Protected enumerations are those that are specifically referenced in IEEE or SISO standards/guides. For example, if a particular enumeration is identified in IEEE Std 1278.1TM, then it shall not be changed in SISO-REF-010 by the SWG Enumerations without a corresponding change in the form of an approved, balloted, and published revision of the standard.

Additionally, an entire field (of a record, such as in a DIS PDU) might be considered protected if all of the current enumerations for that field have specific interaction protocols (issuance and receipt rules) defined in the corresponding IEEE or SISO standard. In this case, we strongly recommend that new enumerations not be added to that field without a similar PCR to the corresponding PSG identifying a similar set of rules. The SWG Enumerations does not require that these rules be finalized in the approved, balloted standard or even be an approved PCR by the corresponding PDG because these are not changes to the balloted product, but extensions to the balloted product. This is a different use case than specific, protected enumerations.

7.4 Entity Type Enumerations Guidelines and Rules

The rules defined in this section apply to all entity type enumerations contained in SISO-REF-010. Entity Types are 64-bit records of seven enumerations found in several DIS PDUs and records, most notably the Entity State PDU. Entity Types are also used in similar protocols in RPR FOM-based HLA and TENA. Entity Types are typically arranged in a hierarchical order such that higher-fidelity simulations may depict detailed representations of an entity (such as an F-16B) while lower-fidelity simulations may depict the same entity in a more generic manner (such as an F-16 or a Fighter Aircraft).

7.4.1 Entity Type Country Code

This section provides guidance and rules regarding entity type country codes.

7.4.1.1 Adding Country Codes

This section provides guidance and rules when adding new country codes or modifying existing ones. The following rules shall apply:

- a) When an entity type enumeration is added or modified to reflect a country not presently in the list of country codes, then a new country code value shall be submitted to add the country to the list of countries at, or before, the time the CR is submitted for the entity type itself.
- b) The country code shall not be used to identify regions (e.g., Europe).
- c) The country code shall not be used to identify organizations (e.g., Taliban).

7.4.1.2 General Rules on Country Code Changes

The following general rules apply to all change of country ownership or country design variations:

- a) The country code shall be the new country of ownership (for a valid change in country ownership) or country of design (for a valid country design variation).
- b) The Kind and Domain fields shall remain unchanged.
- c) The Category, Subcategory, Specific and Extra fields need not match any previous owner entity type enumeration.
- d) The entity type enumeration description shall reflect the English version given to the entity by the new country of ownership. The description shall use only the modern English alphabet (upper or lower case), numbers, and normal punctuation (not extended ASCII). The only allowed character set is UTF-8 (see SISO-REF-056 Best Practice 11-8).
- e) A new entity type enumeration shall not be created for the sake of force identification. If no redesign or new designation takes place, a new entity type should not be generated. This will eliminate duplicates of the same entity types.

7.4.1.3 Change of Country Ownership for Uniquely Identified Entity Types

This section provides guidance and rules to be followed in the case of a change of country of ownership for uniquely identified entity types. When the ownership of a unique entity (e.g., a ship such as the USS Kitty Hawk aircraft carrier) changes due to that entity being sold or otherwise transferred to another country, a new entity type enumeration shall be assigned to denote this change of ownership and the new designation. The following rules shall apply:

- a) The entity need not have been previously assigned an entity type enumeration.
- b) The previous entity type enumeration, if one exists, shall not be deprecated as a result of the change of country ownership. Its printed description shall be revised by the automated toolset to have the notation "(transferred)" added to indicate that the ownership of that uniquely identified entity type has changed. To do this, the entry is updated and marked as transferred.
- c) Additional changes of country codes between the present country of ownership and a different country are permitted. Each change is again identified by a uniquely identified entity type enumeration with a notation added to the previous owner as described above.
- d) The comments tab (or individual comments per line if not too long) in the CR for a Change of Country Ownership shall identify that this is the transfer of ownership from one country to another and the two countries involved in the transfer shall be identified. The comments shall contain, as a minimum, the following information:
 - 1) The previous entity type enumeration and its associated description shall be identified, if one exists.
 - 2) If there is no entity type enumeration for the previous owner, that shall be noted.
 - 3) It shall be clearly indicated when the transfer has taken place, including the best date known that the transfer occurred. The date should be as specific as possible.

- e) The extent to which the physical, functional or performance characteristics of a uniquely identified entity type change, or do not change, because of a change of ownership between countries is immaterial to the new designation. It is understood that some characteristics or none may be modified. However, a legitimate transfer of uniquely identified entity types shall always be allowed.
- f) A change of country ownership shall not be allowed if the transfer has not already occurred.
- g) The Base ID of the new entity type shall be set to the entity type from which it was transferred. The Base ID of the transferred entity type shall be set to the new entity type.
- h) The original ship naming details are to be added as a footnote (see 7.4.5.1)

7.4.1.4 Country Design Variation of Recurrent Entity Types

The variation of the original design of a recurrent entity type to meet a different country's requirements may be added as a new entity type under the new country code. This is referred to as a country design variation. Whether all or part of the modification to the original design to satisfy another country's requirement was done by the original company, or companies in other countries including the country to which the design variation is attributed does not affect the decision as to whether a country design variation occurred. The following rules shall apply:

- a) A country design variation shall be listed under the country for which the variation was designed, produced or manufactured.
- b) The entity type description shall include the original description used for the original design, unless the variation has been given a new title or model number in which case that will be used instead.
- c) A country design variation that is presently listed as an entity type under the original country of design where a notation has been included for another country, e.g. Mk 23 (Argentina), may have a new entity type enumeration submitted under that country's list of enumerations. In this case, the original entity type is to be considered miscategorized and the rules for Miscategorized Entries as discussed in 7.4.4 shall be followed.
- d) The comments in the CR for a Country Design Variation shall identify that this is a change in design from one country to another and the two countries involved in the transfer shall be identified.
- e) The description of the new entity type enumeration shall include an annotation of "(variation)."
- f) The Base ID of the new entity type shall be set to the entity type from which the design is derived.

7.4.2 Entity Type Kind Usage

This section provides additional guidance on entity type kinds.

7.4.2.1 Platform

The Platform kind refers to vehicles such as ships, tanks, aircraft and submarines. The Platform kind also refers to systems and structures such as Surface-to-Air Missile (SAM) systems, command and control systems, various types of facilities, oil rigs, etc. These systems are sometimes composed of different types of platforms and subsystems such as command centers, special purpose vehicles, sensors, guns, launchers, etc. It should be noted that these systems are typically arranged as a set of heterogeneous subsystem entity types vs. a hierarchical entity type structure. Lower-fidelity representations can use the aggregate system-level entity type, and higher-fidelity representations can use the de-aggregated subsystem-level entity types.

Also note that components of these systems can sometimes be similar to entity types that are found in other categories or kinds. For example, there are many radar entity types enumerated as subsystems in the Platform kind that are similar to radars found in the Sensor/Emitter kind (see section 7.4.2.9, Sensor/Emitter). For classification purposes, subsystems that strictly support only a particular platform system are enumerated within the respective platform system, but subsystems that can operate in a stand-alone manner or that can support multiple systems are enumerated elsewhere such as in the Sensor/Emitter kind.

7.4.2.2 Munition

The Munition kind includes entities such as missiles, ballistic rounds, bullets and torpedoes. Munitions are further identified in terms of their fuse and warhead.

7.4.2.3 Life Form

The Life Form kind refers to dismounted infantry, scouts, SEALs, or other humans, as well as animals like whales and shrimp. Life forms are treated similarly to platforms since they can move and (some) can fire munitions. The life form country code denotes its country of origin. The Subcategory field specifying the number of individuals allows representation of one or more life forms using one Entity Type.

Country specific category overlays for human life forms are also available, these can be developed to differentiate country specific information when the generic UID 472 – Land Categories does not provide the specific information (see ‘UID 500 – Australian Category Overlay’ and ‘UID 476 – U.S. Category Overlay’ for examples).

7.4.2.4 Environmental

The Environmental kind refers to entities in the usual physical-object sense, e.g. clouds and ice bergs, as well as inherent characteristics of a particular environment, such as sea state or transmissivity profile. The Subcategory field defines the size of the environmental entity.

7.4.2.5 Cultural Feature

The Cultural Feature kind refers to engineering and natural effects such as craters, bridges, vehicle tracks, etc.

7.4.2.6 Supply

The Supply kind refers to supplies other than munitions, such as fuel, food and personnel. The Supply Domain Field is used to assign the class of supply to the item. For additional information refer to CR03584 in the Version 24 Change Block file in the digital library.

7.4.2.6.1 Supply Kind Domain

The domain values are listed in ‘UID 600 – Supply Kind’. Values 1 through 10 were based off information contained in AR 710-2, and additional values have been added for other supply class uses.

7.4.2.7 Radio

The Radio kind refers to electronic devices for the communication of both audio and data. Radios use a record called a Radio Type that is the same as an Entity Type, but each of the fields for Category, Subcategory, Specific, and Extra have definitions unique to radios. Users of DIS, IEEE Std 1278.1, should refer to 6.2.71 for more information on the Radio Type record.

7.4.2.8 Expendable

The Expendable kind refers to devices that are dispensed from another entity. The devices may be active or passive countermeasures such as chaff, flares and decoys, or non-countermeasures such as signal and illumination flares.

7.4.2.9 Sensor/Emitter

The Sensor/Emitter kind refers to sensors and emitters, such as stand-alone radars, jammers, and detection systems that are not part of another platform or system described by another Entity Kind. They might also be attached parts of another entity (typically a Platform).

A simulation object should be enumerated as a member of the Sensors and Emitters entity type kind if the primary purpose of the represented item is to act as a sensor or emitter. Sensors and emitters that are components of an entity with some other purpose should not be enumerated by this entity type kind. For example, the AN/MPQ-53 radar used with a Patriot missile unit is in this entity type kind, but the “Gun Dish” radar mounted on the ZSU-23-4 as an on-carriage fire control sensor is not.

7.4.3 Weapon Systems and Ammunition

This section provides additional guidance on weapon systems and ammunition.

- a) For variants of an entity that are based purely on weapon system changes, the variation shall be identified in the Extra field of the Entity Type record. The Extra field shall be used even if the Specific field is not specified (i.e. zero).
- b) Variations of an entity type shall not be made to identify ammunition loads.
- c) Ammunition loads shall not be specified in the Entity Type.

7.4.4 Miscategorized and Duplicate Entries

This section provides guidance on resolving existing entries that have been miscategorized or duplicated. Generally, this problem may occur when the Change Request for those entries is not properly reviewed by knowledgeable participants on the subject, or there is confusion or unclear direction on what certain categories (including kinds, domains, and country codes) mean. When a particular miscategorization is recognized, the proper approach to resolving it is as follows:

- a) Add the new Entity Type in the proper location (kind, category, etc.)
- b) Deprecate the miscategorized Entity Type
- c) Link the deprecated Entity Type to the new one via the Base ID field
- d) Provide justification for the change in either or both the comments for each line or the comments for the CR (separate tab)

When a particular duplication is recognized, the proper approach to resolving it is as follows:

- a) Deprecate one of the duplicated Entity Types (chosen by the knowledgeable participants and could be based on miscategorization or even program impact)
- b) Link the deprecated Entity Type to the other one via the Base ID field
- c) Provide justification for the change in the comment field for the CR

Resolving the miscategorization can be implemented in a single CR by specifying a UUID for the new Entity Type and referencing that in the Base ID of the now-deprecated Entity Type (following line).

7.4.5 Uniquely Identified Entity Types

This section defines what should and should not be allowed as a uniquely identified entity type. Currently, only military naval ships and oil platforms are explicitly recommended for use as uniquely identified entity types. Commercial (private) ships are not recommended for unique types, though they are not explicitly disallowed either. A valid use case as presented to the SWG Enumerations could establish a precedent. Life forms and platforms that are largely used as recurrent entity types are explicitly disallowed as uniquely identified entity types. There should be other methods defined for life forms (e.g., the president of the United States) and for most platforms (e.g., tanks) there are too many in number and not sufficiently distinct to warrant unique identification by entity type. Unique identification usually occurs (if necessary) by other means; for example, within DIS unique identification can be accomplished via the Entity Marking field or within a Variable Parameter record. Additionally, the usage of ship prefixes (e.g., HMS) is not allowed; however, hull numbers, classification symbols, and pennant numbers are strongly recommended (when known).

7.4.5.1 Change to ship name

This section describes the process for changing entity names for surface entities (ship names). If a ship name is changed, either due to country renaming or a ship transfer, the 'footnote' field is to include the previous ship name, and the year of change (if known). If there has been more than one name change, include both details of both. (e.g. '*ex African Lion (2013), ex Handy Gunner (2005)*')

7.4.6 Implicit Entity Types

Because of the potential composition of the various fields within the Entity Type record, there are a huge number of possible Entity Type enumerations. It would not be feasible, or desirable, to explicitly list all of these enumerations within the XML file, let alone the printable documents. For example, just listing every Platform Category for every combination of Domain and Country would produce a very large number of Entity Types.

Instead, SISO-REF-010 shall only enumerate a subset of these implicit Entity Types; specifically, those deemed useful as illustrative examples using the Country code for Other (0). These examples are intended to provide a reference schema for the reader to better visualize and understand the given area of Entity Types. The initial plans for these illustrative examples are the civilian platforms for the Land (1), Air (2), and Surface (3) Domains.

All implicit entity types are valid on-the-wire. For example, a user could desire to use all of the following as valid enumerations: 1.3.225.81.3 (U.S. generic dry cargo container ship), 1.3.0.81 (non-country specific generic dry cargo ship); 1.3.0.81.3 (non-country specific, generic dry cargo container ship). However, some of the non-country-specific variants have been added to SISO-REF-010 to illustrate the schema.

7.5 Emitter Name Guidelines and Rules

Emitter Name is the 16-bit enumeration intended to define an emitter system, as identified by UID 75. Emitter Name enumerations are associated with one or more of the following descriptions: National Nomenclature, NATO Reporting Name, or Commercial Designation.

Priorities for assigning Emitter Name descriptions shall be defined in highest to lowest order as: (1) NATO Reporting Name, (2) Commercial Designation, and (3) National Nomenclature. If more than one Emitter Name description is associated with a particular Emitter Name enumeration, the submitter shall ensure that the associations do not reveal sensitive information. While this is true for any data submitted to SISO, this area is particularly susceptible.

New Emitter Name enumerations should be identified such that they are placed in alphabetical order. If this is not possible, however, then existing enumerations shall not be rearranged to accommodate alphabetical order. Electronic Intelligence Notation (ELNOT) is not allowed in the Emitter Name enumerations.

8 Products and Services

8.1 SISO-REF-010

8.1.1 Files

SISO-REF-010 is the Enumerations product, which consists of the following files (additional translators and documents may be added prior to update of this OPMAN, as authorized by approved CRs):

- XML file – This is the enumerations database and is the source for the printable documents. All byproducts are generated from this file. There is also a schema file to go with the XML. As a general guideline, if a simulation system processes these files, it is highly recommended that the developers allow for as-yet undefined elements or attributes. Future schema changes could add new elements or attributes and it is important that designers account for such possible changes at the beginning.
- Schema (.XSD) – The schema defines the structure of the machine readable XML database that is used to generate the human readable enumerations data products.
- Microsoft Word™ document – Similar to the previous versions, this contains all the enumerations and accompanying text. It is a byproduct of the enumerations database, but the process to generate it requires a template and a software program (see 8.3).
- PDF document –Produced from the Word document.
- Spreadsheet translation file – This is an XML translation file (XSLT) that directly reads in the XML. To view this in Microsoft Excel™ you need to start Excel, open the XML file and select the translation file.
- HTML file – This is an HTML file built from the document without change tracking enabled.
- Read me – This provides a brief description of the files.
- C99 header translation file and Makefile – This is an XML translation file (XSLT) that directly reads in the XML and produces a C99-compatible header file.
- The final CR Status for the CR's incorporated into the present version are included.
- Other files might be added as agreed upon by the SWG Enumerations. (e.g. if this document has been updated and release at the same time as the SISO-REF-010)

The XML, XSD, and XSLT filenames do not include the SISO version number, draft number, or release candidate number. This is to facilitate source code processing with consistent filenames.

8.1.2 Color Scheme and DRAFT version changes

8.1.2.1 Word and PDF release versions

SISO-REF-010 (final release version) uses a defined color scheme to aid readability. Normal black text is used for all existing enumerations. **Red text** signifies changes to the current version from the previous one (usually additions, but also for updates to text or footnotes). **Gray text** indicates that the enumeration has been deprecated. **Gray** supersedes **red** if the deprecation change was made in the current version. Deleted text and enumerations are not displayed at all (they simply don't exist anymore). See 8.3.2.5 and 8.3.2.6 for additional clarification of text added to the printed version to aid readability.

SISO-REF-010 (DRAFT version) uses the information in the above paragraph, as well as the additional information in brackets at the end of the description to display DRAFT release information:

- (Pending) – the change request has been submitted but is still pending review.
- (Future) – the change request has been submitted and reviewed but will be officially included in future release (e.g. the CR deals with an entry that is still being built and has not been 'officially' released for use.
- (On Hold) – the change request has been submitted and reviewed but has been placed on hold by the EWG SWG until a future release (e.g. the CR relates to a future release of the DIS standard).

8.1.2.2 Excel release versions

SISO-REF-010.xlsx (final release version) uses a defined color scheme to aid readability. Normal black text is used for all existing enumerations. **Red text** signifies changes to the current version from the previous one (usually additions, but also for updates to text or footnotes). Strikethrough text indicates that the enumeration has been deprecated. Deleted text and enumerations are not displayed at all (they simply don't exist anymore). See 7.2 for additional clarification of text added to the printed version to aid readability.

SISO-REF-010.xlsx (DRAFT version) uses the information in the above paragraph, as well as the additional information to display DRAFT release information:

- Pending changes displayed in **Yellow text** – the change request has been submitted but is still pending review.
- Future changes displayed in **Light Blue text** – the change request has been submitted and reviewed but will be officially included in future release (e.g. the CR deals with an entry that is still being built and has not been 'officially' released for use).
- On Hold displayed in **Pink text** – the change request has been submitted and reviewed but has been placed on hold by the EWG SW1G until a future release (e.g. the CR relates to a future release of the DIS standard).

8.2 Change Request Submission Forms

The automated process requires specialized submission forms for enumerations. These have been implemented as Microsoft Excel™ templates, which are referred to as the Change Request (CR) forms. To submit a change request for enumerations, obtain the appropriate template from the [SISO digital library](#) (latest version), fill it out according to the instructions, name the file appropriately, and submit the file to the [SISO Enumerations for Simulation Discussion Folder](#). The CR Instructions file has built-in links to the templates; with descriptions for what enumerations they should be used. This file also has details on every field located within the templates.

CRs shall contain, at a minimum, the following fields:

- a) Name of the submitter (or organization)
- b) Organization to which the submitter belongs (affiliation) (N/A if the submitter is an organization)
- c) E-mail address of the submitter
- d) Date of the initial submission
- e) Phone number of the submitter (optional, a CR will not be rejected if no number is given)
- f) General comments about the CR (optional)
- g) Enumerations
 - 1) Change type (add, deprecate, update, withdrawn, informative, retired)
 - 2) Value(s) (the column headers might be different for different templates)
 - 3) Description (name)
 - 4) Comment (optional) – see 8.2.3 for more information
 - 5) Footnote (optional) – see 8.2.3 for more information
 - 6) Base ID (optional) – This attribute is used to link one enumeration to another. Several usages are explained in other sections. This is not applicable to all enumeration types.
 - 7) UUID (optional) – This attribute is used to uniquely and globally identify the enumeration even outside the scope of SISO-REF-010.

8.2.1 CR Submission

All new enumeration Change Requests (CRs) shall be posted to the SISO Enumerations for Simulation Discussion Folder. Do not submit CRs privately to anyone, including any officers or editors of product support or product development groups, or the SWG Enumerations Lead. Members may, of course, collaborate before submittal, but sending a private e-mail does not constitute a submission.

To submit a CR, log into the SISO web-board and go to the SISO Enumerations for Simulation Discussion Folder:

<https://discussions.sisostds.org/index.htm?A0=SAC-SWG-ENUM>.

Revisions of a CR must be made on the file returned from the automated process, without changing the filename (but see 8.2.2c)) for an exception to this guideline). Do not make revisions until the CR has been processed and assigned a number.

8.2.2 CR File Naming Guidelines

It is important to name the CR file appropriately. This file name is used in the CR Status sheet produced by the automated toolset and would also be useful for someone searching through a local copy of change requests. Although the toolset renames each file with a given CR number, thus ensuring uniqueness, it is still important to have a good technique. The following guidelines should be adopted:

- a) Do not use enumeration values in the file name. For example, if a member is recommending a particular entity type value for a change request, he or she shall not use that value (any part of it, so not even just the Specific value) in the file name. Doing so will cause confusion if the actual enumeration changes during the life of the CR (this is not uncommon).
- b) The toolset will prepend "CRX - " to the file name, so avoid a name that would cause confusion. The "X" will be the actual CR number, followed by a revision letter if it has been revised.
- c) The file name cannot change except for updating the revision letter (or adding one) immediately following the CR number. The workaround for this, if it is really necessary, is to withdraw the whole CR and submit a new one under a different name. The first CR does not have a revision letter. The first revision (update to the CR) is therefore A.
- d) Be descriptive in the file name, but not overly long (recommended maximum of 64 characters).
- e) Be aware that others could recommend changes to the CR that would cause confusion in the file name. For example, if the file is named based on one of the specified entities and during the course of the CR that entity is dropped or it changes, then the CR file name will be confusing.
- f) The reflector may append characters such as underscores, parentheses, and numerals to avoid naming conflicts on the reflector forum itself. These are ignored by the toolset and do not necessarily constitute a violation of the guideline in c) above. However, do not purposefully append such characters or numbers because the reflector will still do so.
- g) Do not include dates or personal/organizational identifying information in the name of the CR.

8.2.3 Comments and Footnotes

Include as much information as necessary to prove the case within the comments field(s) of the CR. Not only is this used during the review of the CR itself, but it will also be referred to in the future. An example of the type of information to include is a link to one or more publicly-accessible websites. You may include general comments about the whole CR in the separate tab titled "Comments." Also, the comment fields should be used to track who updates the CR when that person is different from the submitter.

If there is important information or some other reference that must be retained with the enumeration itself (and not simply recorded for posterity in the comments), then use the footnote field in the CR.

Footnotes are only added on new or updated enumeration entries and not on deprecations. To add a footnote while deprecating an entry, use a separate line to update the entry first.

8.2.4 CR Status Report

The CR Status report is updated during the course of the next release development period by the SWG Enumerations lead (or designate) or automated toolset and a final CR Status report is generated to coincide with the release at the end of the period (and is renamed appropriately and included with the drafts, release candidates, and final release).

The CR Status report is used during SWG Enumerations formal review (telecon or SIW meetings) and is suggested for individual review and recommendation. This CR Status report provides the following information on each CR, with the column title provided in parentheses as necessary:

- a) CR Number (CR) – This is the tracker number.
- b) Revision (REV) – This is the version of the Change Request, blank for the initial submission.
- c) Submission Date (SUBMIT DATE) – This is the initial submission date.

- d) Title – This is initially the file name of the CR as pulled by the automated toolset, but may be updated if the name was inappropriate.
- e) Submitter – Who submitted the original CR (if known).
- f) Status – denotes status of the CR according to the approval processes description at paragraph 6.
- g) Status Date – identifies the most recent date of the current status.
- h) Manual Processing – identifies if the CR needs to be processed manually and not by the automated toolset.
- i) Comments – identifies details about the CR found during review, including required changes, reasons for the status, and actions to be taken and by whom.
- j) Dependency – The number of the CR upon which this CR depends. If non-zero, then the CR is processed in a second step by the automated toolset for the purposes conflict resolution.

8.2.5 CR Instructions

Detailed instructions of fields within the templates and what they mean are provided in the CR Instructions file located alongside the templates themselves. If more lines are needed, simply add them to the bottom (insert prior to the last orange row or copy a blank orange row to retain the formatting).

Note: For hierarchical enumerations like Entity Types, there is a schematic difference between zero values and blanks. By inserting a zero value or allowing a trailing zero at the end of the submitted Entity Type, the direction to the automated tool is to create that leaf node in the hierarchy. For example, consider the value 1.1.225.2.5.22.0, which is the Stryker Mobile Gun System. If the zero were retained, then the Entity Type at the Specific level would not be a Stryker Mobile Gun System. To create this Entity Type at the Specific value, the Extra value in the CR must be blank (not zero). Zero instead might mean Other, Not specified, or have some other meaning.

When adding hierarchical types (e.g., Entity Type), add in the more general definition (parent element) before the more specific (child element). For example, the Entity Type 1.1.13.3.26 should be added before 1.1.13.3.26.1.

Although the automated toolset may allow for it, the submitter should not “Add” Entity Type entries for implicit values that are located in other tables. For example, when a particular Category has not been used for a certain country code, the submitter may feel obligated to add that Category, but this is not necessary because if an error is made, then the CR would be rejected, and the user would be inconvenienced (at best). You may instead include such information and then mark those entries as “Informative” so that they can be referenced. This is also useful when submitting and updated several entries. For example, if updating many of the M915 entries, it would be helpful to include the whole list so that reviewers can see the other existing values and their descriptions.

8.3 Automated Process

One of the high-level requirements is to automate the processing of enumerations. We therefore need an automated process description and several tools to perform or help in performing the tasks in that process. Additionally, we also need some guidelines for this automated process to facilitate it within such a diverse group.

8.3.1 Licensing Position Statement

Any tools developed for use by the SWG Enumerations should not be dependent on any one person (or organization) for running the tools or for modifications to the tools in the future, i.e. if that person/organization is no longer able or willing to maintain and operate the tools then somebody else can take them over.

Tools developed for use by the SWG Enumerations shall be released with an OSI approved license (<https://opensource.org/licenses>) or another license that complies with the OSI's Open Source Definition (<https://opensource.org/docs/osd>). Specifically, the SWG Enumerations recommends use of either the Apache 2.0 or Boost Software licenses as referenced below:

- Apache 2.0 – <https://opensource.org/licenses/apache2.0.php>
- Boost – <https://opensource.org/licenses/bsl1.0.html>

Use of third party tools, such as compilers, to create the developed tools is acceptable providing there is a free or open source version of the third party tool available. The use of either Microsoft Word™ or Microsoft Excel™ is also acceptable. Tools used to produce enumeration work products may use the software associated with that work product format (for instance, Microsoft Access™ may be required to produce the enumeration database in the Microsoft Access™ format). The SWG Enumerations community shall decide on the suitability of proposed tools.

8.3.2 Automated Toolset

A number of tools have been provided to facilitate automated or semi-automated processing of the enumerations.

8.3.2.1 Overview

Figure 2 below illustrates the tool chain to support the automated process of CRs.

The components of the automated process are described in Table 1.

Table 1: Automated Process Components

Tool	Purpose
Registrar	Assigns Change Request numbers to the CR and updates the CR status document
Updater	Processes Change Requests and updates the XML Database
Word Generator	Creates the Word version of SISO-REF-010
Excel Generator	Creates the Excel version of SISO-REF-010
Status Publisher	Sends copies of CR Status document to the Enumerations Reflector
Publisher	Updates the subversion Configuration Management System with the latest XML Database

The intention is to rerun the tool chain at regular intervals. This way updates to CRs are picked up, validated and incorporated into the working copy. Each rerun starts with the previously approved XML database. After the SWG Enumerations provides an approved block of CRs for a specific period, the tool chain is run to produce the approved SISO-REF-010 database and associated work products (drafts and release candidates).

Currently the two **Publishers** are not under development – their activities will be performed manually in the meantime.

The Excel Generator is currently the XSLT script produced in conjunction with the initial XML/XSD.

NOTE:

- a) On occasion manual intervention is required to fix errors, e.g. a file mistakenly identified as a new CR instead of an update.
- b) When the approved SISO-REF-010 is created the CR Status document (updated with the final statuses, dates, etc.) is provided with the CR block in the approved location. The CR Status document is then effectively split by deleting all closed CRs and this becomes the new CR Status going forward until the next iteration. It's possible for the CR Status to be empty prior to the next quarter if all open issues are resolved.

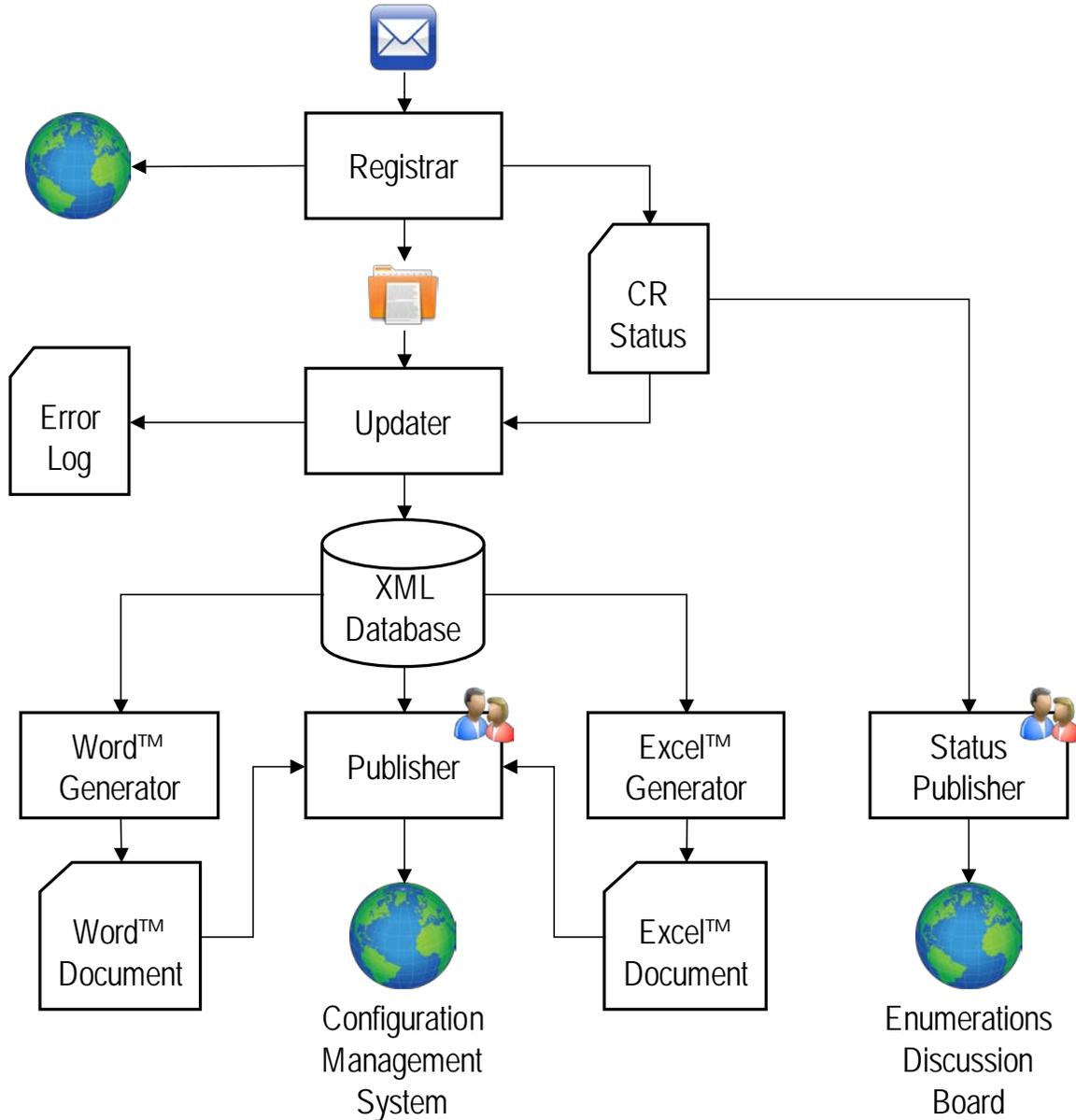


Figure 2: Automated Process

8.3.2.2 Registrar

The Registrar tool performs the following:

- a) Extracts CRs from the SISO-ENUM reflector (currently performed manually).
- b) Determines if the CR is correctly formatted, else mark it for manual review.
- c) Determine if the CR is new or an update.¹
- d) If the CR is new then:
 - 1) Allocate the next CR number.
 - 2) Update the CR Status with the Date, Title (from the file name or thread name), Submitter, set the Status to OP and the Manual Processing to No.

¹ An updated CR is one that has an identical file name (including CR number) to an existing CR.

- 3) Update the CR to add the CR number.
- 4) Rename the CR file to include the CR number in the file name.
- e) If the CR is updated then:
 - 1) Update the CR Status with the revision number.
 - 2) If all the entries in the CR have a Change Type of *withdrawn* or *informative* then set the Status to RJ (note that individual elements of the CR can be *withdrawn* or *informative*, whilst others are not). If not all entries are *withdrawn* or *informative*, then set the Status to RA.
 - 3) Rename the CR file to include the CR number and revision letter in the file name.
- f) Move the CR file into the submitted directory.
- g) Post the CR file (which now contains the CR number and, if appropriate, the revision letter) to the same thread in the SISO-ENUM reflector (currently performed manually).

8.3.2.3 Updater – Standard Mode

When running in standard (daily) mode the **Updater** tool performs the following:

- a) Clear (remove) all status attributes in the XML currently set to new.
- b) Process the latest revision of each CR in the submitted directory. Process all CRs except CR's that are marked as re-work (RW) and CR's with *manual processing* set to Yes in the CR status document.
- c) For each element in the CR:
 - 1) Ignore elements marked as *withdrawn* or *informative*.
 - 2) Log an error in the following cases and continue to the next element:
 - i. The element is marked as *deprecate* and the enumeration does not exist in the DB.
 - ii. The element is marked as *update* and the enumeration does not exist in the DB.
 - iii. The element is marked as *add* and the enumeration exists in the DB.
 - iv. The element is marked as *deprecate* or *update*, a UUID is provided, and the UUID doesn't match the one in the DB for the same element.
 - 3) If the element is marked as *deprecate* and the enumeration exists in the database then set the *deprecated* attribute to *true*.
 - 4) If the element is marked as *update* and the enumeration exists in the database then update the enumeration description, footnote (deleting the existing footnote if this field is blank), and Base ID.
 - 5) If the element is marked as *add* and the enumeration does not exist in the database then:
 - i. Add the enumeration, including the footnote and Base ID.
 - ii. If a UUID is provided, then assign the given UUID to the enumeration.
 - iii. If a UUID is not provided, then create and assign a new UUID and update the CR.
 - 6) Set the *status* attribute to pending.
 - 7) If the element is marked as *add* or *update* then set the variation and transferred flags as indicated.
 - 8) Add the CR number & revision letter to the list of CRs for the enumeration.
 - 9) If the CR was updated then post the CR file to the same thread in the SISO-ENUM reflector (currently performed manually).
- d) If an error has been logged during the processing of a CR then email the updated error log to SISO-ENUM reflector (currently performed manually) (same thread as the CR, if possible)

8.3.2.4 Updater – Final Mode

When producing the approved SISO-REF-010 document² the **Updater** tool performs the following:

- a) Clear (remove) all *status* attributes in the XML currently set to new.
- b) Process the latest revision of each CR in the submitted directory. Ignore CRs not marked as OA or with *manual processing* set to Yes in the CR status document.
- c) For each element in the CR:
 - 1) Ignore elements marked as *withdrawn* or *informative*.

² On first run of the Updater tool for the approved SISO-REF-010, the tool will produce a release candidate (RC) which shall be sent to the SISO-ENUM reflector for editorial checking to ensure that all approved CRs have been incorporated correctly. If necessary, additional release candidates will be produced to correct any errors.

- 2) Log an error in the following cases and continue to the next element:
 - i. The element is marked as *deprecate* and the enumeration does not exist in the DB.
 - ii. The element is marked as *update* and the enumeration does not exist in the DB.
 - iii. The element is marked as *add* and the enumeration exists in the DB.
 - iv. The element is marked as *deprecate* or *update*, a UUID is provided, and the UUID doesn't match the one in the DB for the same element.
- 3) If the element is marked as *deprecate* and the enumeration exists in the database then set the *deprecated* attribute to *true*.
- 4) If the element is marked as *update* and the enumeration exists in the database then update the enumeration description, footnote (deleting the existing footnote if this field is blank), and Base ID.
- 5) If the element is marked as *add* and the enumeration does not exist in the database then:
 - i. Add the enumeration, including the footnote and Base ID.
 - ii. If a UUID is provided, then assign the given UUID to the enumeration.
 - iii. If a UUID is not provided, then create and assign a new UUID and update the CR.
- 6) Set the *status* attribute to new.
- 7) If the element is marked as *add* or *update* then set the variation, transferred flags as indicated.
- 8) Add the CR number & revision letter to the list of CRs for the enumeration.
- 9) If the CR was updated then post the CR file to the same thread in the SISO-ENUM reflector (currently performed manually).
- d) If an error has been logged during the processing of a CR then:
 - 1) Email the updated error log to the SISO-ENUM reflector (currently performed manually) (new thread)
 - 2) Abandon changes to the XML database.
 - 3) Stop run (subsequent tools in the chain are not run).
- e) If there is no error then update the meta data:
 - 1) Amend title to include year of release and year version (after the first release in a year) and release candidate (if appropriate).
 - 2) Update the data.
 - 3) Update the revisions list.

8.3.2.5 Microsoft™ Word Generator – Standard Mode

When running in standard (daily) mode the **Microsoft™ Word Generator** tool performs the following:

- a) Create a new document from the template.
- b) Process the XML database and for each enumeration:
 - 1) If the enumeration is marked as *deprecated* add the text "(deprecated)" to the end of the enumeration description, and set the font color to gray.
 - 2) If the enumeration is marked as *open pending* add the text "(Pending)" to the end of the enumerations description and set the font to *red*.
 - 3) If the enumeration is marked as *on hold* add the text "(On Hold)" to the end of the enumerations description and set the font to *red*.
 - 4) If the enumeration is marked as *open future* add the text "(Future)" to the end of the enumerations description and set the font to *red*.
 - 5) If the enumeration is marked as Retired add the text "(Retired)" to the end of the enumeration description.
 - 6) For entity type enumerations:
 - i. If the enumeration is marked as transferred add the text "(transferred)" to the end of the enumeration description
 - ii. If the enumeration is marked as variation add the text "(variation)" to the end of the enumeration description
- c) Set the document meta data:
 - 1) Set the footer to denote that this is an unapproved draft.
 - 2) Update the document number for the current version number and draft number in accordance with SISO-ADM-001 (first page and header).
- d) Update the change history to reference the incorporated CRs.

8.3.2.6 Microsoft™ Word Generator – Final Mode

When producing the approved SISO-REF-010 document the Microsoft™ Word Generator tool performs the following:

- a) Create a new document from the template.
- b) Process the XML database and for each enumeration:
 - 1) If the enumeration is marked as deprecated add the text "(deprecated)" to the end of the enumeration description, and set the font color to gray.
 - 2) If the enumeration is marked as new then set the font to red .
 - 3) For entity type enumerations:
 - i. If the enumeration is marked as transferred add the text "(transferred)" to the end of the enumeration description
 - ii. If the enumeration is marked as variation add the text "(variation)" to the end of the enumeration description
- c) Set the document meta data:
 - 1) Set the footer to denote that this is an approved draft.
 - 2) Update the document number for the current version number in accordance with SISO-ADM-001 (first page and header).
 - 3) Update the change history to reference the approved CRs.

8.3.3 Examples

The following are examples of entity types and how the toolset should process them.

8.3.3.1 Example 1

Let us assume that somebody submits the following change request:

Change Type	Enumeration	Name
Add	1.3.224.5.1	Type 77

Currently the UK has no category 5 entities. However, category 5 for the surface domain is defined. Therefore the toolset will automatically add the "missing" category, so that it would be as if the submitter had asked for the following:

Change Type	Enumeration	Name
Add	1.3.224.5	Destroyer (DD)
Add	1.3.224.5.1	Type 77

The addition of the Category should not be included because if even a small typo is made, then the CR will fail to be processed. Instead, if hierarchy is useful in order to review a CR, include that information in the comment section. Moreover, a Category can be added in the Entity Type CR, it must be added explicitly to the specific Category table for that domain. This requires a single field enumeration CR and not the Entity Type CR, and will be reviewed and approved separately. See the following example.

8.3.3.2 Example 2

Let us assume that somebody submits the following change request:

Change Type	Enumeration	Name
Add	1.3.224.5	Light Cruiser
Add	1.3.224.5.1	Type 77

The toolset checks that the category name matches the category description from the appropriate table. They do not match so the toolset will report an error from this example.

8.3.3.3 Example 3

Let us assume that somebody submits the following change request:

Change Type	Enumeration	Name
Add	1.2.82.1.1	Metaxa

Currently Greece does not have a section for aircraft, but the entity kind, domain and country are valid and category 1 for the air domain exists, so the tool set will create a new element in the XML database for Greek aircraft (allocating a new UUID for it) and adding the (pre-existing) category as well.

8.3.3.4 Example 4

Let us assume that somebody submits the following change request:

Change Type	Enumeration	Name
Add	1.3.224.19.1	Estuary Class
Add	1.3.224.19.1.1	Forth
Add	1.3.224.19.1.2	Severn

The tool would report an error that category 19 for the surface domain has not been defined. Another change request (single field enumeration) would have to be submitted to add category 19.

8.3.3.5 Example 5

Let us assume that somebody submits the following change request:

Change Type	Enumeration	Name
Add	1.3.224.19	Prison Ship
Add	1.3.224.19.1	Estuary Class
Add	1.3.224.19.1.1	Forth
Add	1.3.224.19.1.2	Severn

The tool would report an error that category 19 for the surface domain has not been defined. Another change request (single field enumeration) would have to be submitted to add category 19 to the appropriate table. This is very similar to the previous example, except in this case the category is attempted to be explicitly added. But, this is not how categories are added.

8.3.3.6 Example 6

The following provides an example CR of a transfer of a uniquely identified entity type. The carrier Admiral Gorshkov (1.3.222.1.4.1) was purchased from Russia by India on January 20, 2004. India has renamed the ship Vikramaditya. The CR for this change should be drafted as follows:

Change Type	Enumeration	Name	Flags	Base ID
Add	1.3.99.1.1	Vikramaditya Class	N/A	
Add	1.3.99.1.1.1	Vikramaditya	N/A	1.3.222.1.4.1
Update	1.3.222.1.4.1	Admiral Gorshkov	T	1.3.99.1.1.1

The tool will first add the new entries for India. Note that Category 1 for India is implicitly Carrier and (Subcategory 1 should be defined prior to this CR or as the first entry in this CR). When this carrier is added to India, its Base ID is set to the Russian entry. The second line updates the Russian entry to signify transferred (the T flag) and to also point to the new Indian entry.