NENA Registry System Standard

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Prepared by:
National Emergency Number Association (NENA) Core Services Committee, Data Structures Subcommittee, NENA Registry System Working Group

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1 Executive Overview

When developing and deploying technical standards which employ enumerations, or lists of values, where the enumeration or lists can reasonably be expected to change over time as new technology, vendors, service providers or other stakeholders evolve, a known stable way to maintain the current acceptable values in the enumeration or list is required. The values in the enumeration or list are called a registry. This document describes how registries are created and maintained in NENA.

2 Introduction

2.1 Operational Impacts Summary

When the content of a registry changes, it means that PSAPs may encounter new values in data structures they receive, send or create. Some changes may require new operational procedures to be created or existing ones may need to be modified. Other registry changes may have no practical impact on PSAPs.

2.2 Technical Impacts Summary

The NENA Registry System (NRS) stores registries that are an important component of NG9-1-1 functional elements. Since registries are typically developed in conjunction with NG9-1-1 functional element standards, the technical impacts on NG9-1-1 functional elements are expected to relate, primarily, to the implementation of the enumerations or lists required by each registry. CPE will be impacted to a greater degree since CPE has already been well established in the 9-1-1 industry. CPE manufacturers should consult the NRS as they begin deploying into NG9-1-1 environments. They should also submit new registry entries through the NRS rather than adding values solely to their own system.

2.3 Security Impacts Summary

Registries must be stable, and values must be controlled. If changes can be made without appropriate review and notice, PSAPs may encounter difficulty when new or modified values appear in data objects they encounter. Not all changes have the same impact; some changes may be innocuous, others may require extensive planning, upgrades and training before deployment.

2.4 Document Terminology

The terms "shall", "must", "mandatory", and "required" are used throughout this document to indicate normative requirements and to differentiate from those parameters that are recommendations. Recommendations are identified by the words "should", "may", "desirable" or "preferable".

2.5 Reason for Issue/Reissue

NENA reserves the right to modify this document. Upon revision, the reason(s) will be provided in the table below.

Version	Date	Reason For Changes
70-001	09/17/2009	Initial Document
NENA-STA-008.2-2014	10/06/2014	Update to reflect new committee structure and new template structure.

2.6 Recommendation for Additional Development Work

Tools must be developed for NENA staff or their designee to maintain the registries.

2.7 Date Compliance

All systems that are associated with the 9-1-1 process shall be designed and engineered to ensure that no detrimental, or other noticeable impact of any kind, will occur as a result of a date/time change up to 30 years subsequent to the manufacture of the system. This shall include embedded application, computer based or any other type application.

2.8 Anticipated Timeline

The registries need to be in place prior to NG9-1-1, Version 1.

2.9 Costs Factors

Tool development will require some outlay, or possibly recruiting some "open source" developers.

2.10 Cost Recovery Considerations

As the values for the various data elements are not applicable to one particular company or entity it is felt there will be no cost recovery for maintaining the NENA Registries. Some registries may contain lists of vendors, service providers or other external entities. There could be some charge to add an entry into such registries.

2.11 Additional Impacts (non cost related)

The information or requirements contained in this NENA document are not expected to have any additional impacts, based on the analysis of the authoring group.

2.12 Intellectual Property Rights Policy

NOTE – The user's attention is called to the possibility that compliance with this standard may require use of an invention covered by patent rights. By publication of this standard, NENA takes no position with respect to the validity of any such claim(s) or of any patent rights in connection therewith. If a patent holder has filed a statement of willingness to grant a license under these rights on reasonable and nondiscriminatory terms and conditions to applicants desiring to obtain

such a license, then details may be obtained from NENA by contacting the Committee Resource Manager identified on NENA's website at www.nena.org/ipr.

Consistent with the NENA IPR Policy, available at www.nena.org/ipr, NENA invites any interested party to bring to its attention any copyrights, patents or patent applications, or other proprietary rights that may cover technology that may be required to implement this standard.

Please address the information to:

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Alexandria, VA 22314
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2.13 Acronyms/Abbreviations, Terms and Definitions

Some acronyms/abbreviations, terms and definitions used in this document may have not yet been included in the master glossary. After initial approval of this document, they will be included. See NENA 00-001 - NENA Master Glossary of 9-1-1 Terminology located on the NENA web site for a complete listing of terms used in NENA documents. All acronyms used in this document are listed below, along with any new or updated terms and definitions.

The following Acronyms are used in this document:		
Acronym	**Description**	**(N)ew (U)pdate**
NRS	NENA Registry System	

3 Technical Description

NENA will have need of several registries. Registries have to be created, and potentially redefined as NENA technical standards evolve. New registry values may be created by a range of actions. The current state of a registry must be easily available to any (potentially, authorized) user.

Note: The following text is adopted from RFC5226. Permission has been granted by the authors of RFC5226 to excerpt large sections of the text for use in this document. The text used is copyright by Thomas Narten, Harold Avestrand and the IETF.

Many NENA data structures make use of identifiers consisting of constants and other well-known values. Even after a structure has been defined and deployment has begun, new values may need to be assigned. To ensure that such quantities have consistent values and interpretations across all implementations, their assignment must be administered by a central authority. For NENA standards, that role is provided by the NENA Registry System, NRS (it can't be "NENA Registry Administrator", because the acronym, NRA, wouldn't work!).

In order for NRS to manage a given registry prudently, it needs guidelines describing the conditions under which new values can be assigned or when modifications to existing values can be made. If NRS is expected to play a role in the management of a registry, NRS must be given clear and concise instructions describing that role. This document discusses issues that should be considered in formulating a policy for assigning values to a registry and provides guidelines for authors on the specific text that must be included in documents that place demands on NRS.

Many standards make use of data elements that contain constants and other well-known values. Even after a standard has been defined and deployment has begun, new values may need to be assigned. To ensure that such assignments have consistent values and interpretations in different implementations, their assignment must be administered by a central authority. For NENA Standards, that role is provided by the NRS.

In this document, we call the set of possible values for such a data element a "registry"; its actual value may be an enumeration constant, a text string, a number, or another kind of value. The binding or association of a specific value with a particular purpose within a registry is called an assigned value. Each assignment of a value in a registry is called a registration.

Registries are created by text in a NENA standard. The standard names, describes and defines the policies that NRS uses to manage the registry.

In order for NRS to manage a given registry prudently, it needs guidelines describing the conditions under which new values should be assigned or when (and how) modifications to existing values can be made. This document provides guidelines to authors on what sort of text should be added to their documents in order to provide NRS clear guidelines, and it reviews issues that should be considered in formulating an appropriate policy for assigning values to registries.

Not all registries require centralized administration. In some cases, it is possible to delegate a registry in such a way that further assignments can be made independently and with no further (central) coordination. In some instances, sub registries can be delegated to other entities. When a

part of a registry is delegated, the scope of NRS is limited to the parts of the registry where NRS has authority.

One issue to consider in managing a registry is its size. If the registry is small and limited in size, assignments must be made carefully to prevent exhaustion of the space. If the space is essentially unlimited, on the other hand, potential exhaustion will probably not be a practical concern at all. Even when the space is essentially unlimited, however, it is usually desirable to have at least a minimal review prior to assignment in order to:

- prevent the hoarding of or unnecessary wasting of values. For example, if the space consists of text strings, it may be desirable to prevent entities from obtaining large sets of strings that correspond to desirable names (e.g., existing company names).
- provide a sanity check that the request actually makes sense and is necessary. Experience has shown that some level of minimal review from a subject matter expert is useful to prevent assignments in cases where the request is malformed or not actually needed (i.e., an existing assignment for an essentially equivalent service already exists).

A second consideration is whether it makes sense to delegate the registry in some manner. This route should be pursued when appropriate, as it lessens the burden on NRS for dealing with assignments.

A third, and perhaps most important, consideration concerns potential impact on the interoperability of unrelieved additions to registries. Proposed additions or modifications generally benefit from community review; indeed, review is often essential to avoid future interoperability problems.

When the registry is essentially unlimited and there are no potential interoperability issues, assigned values can safely be given out to anyone without any subjective review. In such cases, NRS can make assignments directly, provided that NRS is given specific instructions on what types of requests it should grant, and what information must be provided as part of a well-formed request for an assigned number.

3.1 Designated Experts

3.1.1 The Motivation for Designated Experts

It should be noted that NRS does not create or define assignment policy itself; rather, it carries out policies that have been defined by others and published in NENA documents. NRS must be given a set of guidelines that allow it to make allocation decisions with minimal subjectivity and without requiring any technical expertise with respect to the protocols that make use of a registry.

In many cases, some review of prospective allocations is appropriate, and the question becomes who should perform the review and what is the purpose of the review. One might think that a NENA working group (WG) familiar with the registry at hand should be consulted. In practice, however, WGs eventually disband, so they cannot be considered a permanent evaluator. It is also possible for registries to be created through individual NENA documents, for which no WG is ever formed. One way to ensure review of prospective assignments is to have the requester submit a document for publication as a NENA Standard or Information Document which documents the assignments, either as the only content of the document, or more commonly, as a section of the document that describes

the use of the assigned values. Such an action helps ensure that the specification is publicly and permanently available, and it allows review of the specification prior to publication and assignment of the requested values. This is the preferred way of ensuring review, and is particularly important if any potential interoperability issues can arise. For example, some assignments are not just assignments, but also involve an element of a protocol or data structure specification. A new option may define data elements which need to be parsed and acted on, which (if specified poorly) may not fit cleanly with the architecture of other options or the base protocols and data structures on which they are built.

In some cases, however, the burden of publishing a NENA document in order to get an assignment is excessive. However, it is generally still useful (and sometimes necessary) to discuss proposed additions on a mailing list dedicated to the purpose or on a more general mailing list (e.g., that of a current or former work group). Such a mailing list provides a way for new registrations to be publicly reviewed prior to getting assigned, or gives advice to persons wanting help in understanding what a proper registration should contain.

While discussion on a mailing list can provide valuable technical feedback, opinions may vary and discussions may continue for some time without clear resolution. In addition, NRS cannot participate in all of these mailing lists and cannot determine if or when such discussions reach consensus. Therefore, NRS may rely on a "designated expert" for advice regarding the specific question of whether an assignment should be made. The designated expert is an individual who is responsible for carrying out an appropriate evaluation and returning a recommendation to NRS.

It should be noted that a key motivation for having designated experts is for NENA to provide NRS with a subject matter expert to whom the evaluation process can be delegated. NRS forwards requests for an assignment to the expert for evaluation, and the expert (after performing the evaluation) informs NRS as to whether or not to make the assignment or registration.

3.1.2 The Role of the Designated Expert

The designated expert is responsible for initiating and coordinating the appropriate review of an assignment request. The review may be wide or narrow, depending on the situation and the judgment of the designated expert. This may involve consultation with a set of technology experts, discussion on a public mailing list, consultation with a working group (or its mailing list if the working group has disbanded, but the mailing list is still active), etc. Ideally, the designated expert follows specific review criteria as documented with the NENA Standard that creates the registry.

Designated experts are expected to be able to defend their decisions to the appropriate NENA Committee, and the evaluation process is not intended to be secretive or bestow unquestioned power on the expert. Experts are expected to apply applicable documented review or vetting procedures, or in the absence of documented criteria, follow generally accepted norms, e.g., those in Section 3.3.

Section 5 discusses disputes and appeals in more detail.

Designated experts are appointed by the Committee chair(s) (normally upon recommendation by the chair of the relevant committee). They are typically named at the time a document creating or updating a registry is approved by NENA, but as experts originally appointed may later become unavailable, the Committee Chair will appoint replacements if necessary.

For some registries, it has proven useful to have multiple designated experts. Sometimes those experts work together in evaluating a request, while in other cases additional experts serve as backups. In cases of disagreement among those experts, it is the responsibility of those experts to make a single clear recommendation to NRS. It is not appropriate for NRS to resolve disputes among experts. In extreme situations (e.g., deadlock), the Committee chair(s) may need to step in to resolve the problem.

In registries where a pool of experts evaluates requests, the pool should have a single chair responsible for defining how requests are to be assigned to and reviewed by experts. In some cases, the expert pool may consist of a primary and backups, with the backups involved only when the primary expert is unavailable. In other cases, NRS might assign requests to individual members in sequential or approximate random order. In the event that NRS finds itself having received conflicting advice from its experts, it is the responsibility of the pool's chair to resolve the issue and provide NRS with clear instructions.

Since the designated experts are appointed by the Committee chair(s), they may be removed by the Committee chair(s).

3.1.3 Designated Expert Reviews

In other standards bodies using similar mechanisms (e.g. the IETF), experience has led to the following observations:

- A designated expert must respond in a timely fashion, normally within a week for simple requests to a few weeks for more complex ones. Unreasonable delays can cause significant problems for those needing assignments, such as when products need values to ship. This is not to say that all reviews can be completed under a firm deadline, but they must be started, and the requester and NRS should have some transparency into the process if an answer cannot be given quickly.
- If a designated expert does not respond to NRS's requests within a reasonable period of time, either with a response or with a reasonable explanation for the delay (e.g., some requests may be particularly complex), and if this is a recurring event, NRS must raise the issue with the Committee chair(s). Because of the problems caused by delayed evaluations and assignments, the Committee chair(s) should take appropriate actions to ensure that the expert understands and accepts his or her responsibilities, or appoint a new expert.
- The designated expert is not required to personally bear the burden of evaluating and deciding all requests, but acts as a shepherd for the request, enlisting the help of others as appropriate. In the case that a request is denied, and rejecting the request is likely to be controversial, the expert should have the support of other subject matter experts. That is, the expert must be able to defend a decision to the community as a whole.

In the case where a designated expert is used, but there are no specific documented criteria for performing an evaluation, the presumption should be that a value should be granted, unless there is a compelling reason to the contrary. Possible reasons to deny a request include:

- Scarcity of values, where the finite remaining values should be prudently managed, or when a request for a large number of values is made, when a single value is the norm.

- Documentation is not of sufficient clarity to evaluate or ensure interoperability.
- The value is needed for an extension, but the extension is not consistent with the documented (or generally understood) architecture of the base protocol or data structure being extended, and would be harmful to the protocol or data structure if widely deployed. It is not the intent that "inconsistencies" refer to minor differences of a personal preference nature. Instead, they refer to significant differences such as inconsistencies with the underlying security model, implying a change to the semantics of an existing data structure, message type or operation, requiring unwarranted changes in deployed systems (compared with alternate ways of achieving a similar result), etc.
- Changes or additions in values would cause problems with existing deployed systems.
- Changes or additions in values would conflict with one under active development by NENA, and having both would harm rather than foster interoperability.

3.2 Creating a Registry

Creating a registry involves describing the registry to be created, an initial set of assignments (if appropriate), and guidelines on how future assignments are to be made. Registries to be managed by NRS must be created in a full NENA Standard.

Once a registry has been created, NRS records assignments that have been made. The following labels describe the status of an individual (or range) of assignments that are not normal assignments for general use:

`Private Use`: Private use only (not assigned), as described in Section 4.1.

`Experimental`: Available for experimental use by any entity. NRS does not record specific assignments for any particular use.

`Unassigned`: Unused and available for assignment via documented procedures.

`Reserved`: Not to be assigned. Reserved values are held for special uses, such as to extend the registry when it becomes exhausted. Reserved values are not available for general assignment.

3.2.1 Well-Known NRS Policy Definitions

Every registry must have a policy for assignments and changes to assignments. The following are some defined policies. These cover a range of typical policies that can be used to describe the procedure for assigning new values in a registry. It is not required that documents use these terms; the actual requirement is that the instructions to NRS are clear and unambiguous. However, use of these terms is recommended where possible, since their meaning is widely understood.

`Private Use` - For private or local use only, with the type and purpose defined by the local site. No attempt is made to prevent multiple sites from using the same value in different (and incompatible) ways. There is no need for NRS to review such assignments (since NRS does not record them) and assignments are not generally useful for broad interoperability. It is the responsibility of the entities making use of the Private Use range to ensure that no conflicts occur (within the intended scope of use).

`Experimental Use` - Similar to private or local use only, with the purpose being to facilitate experimentation.

`Hierarchical Allocation` - Delegated managers can assign values to sub registries provided they have been given control over that part of the registry. NRS controls the higher levels of the registry according to one of the other policies.

`First Come First Served` - Assignments are made to anyone on a first come, first served basis. There is no substantive review of the request, other than to ensure that it is well-formed and doesn't duplicate an existing assignment. However, requests must include a minimal amount of clerical information, such as a point of contact (including an email address) and a brief description of how the value will be used. Additional information specific to the type of value requested may also need to be provided, as defined by the registry. For numbers, the exact value is generally assigned by NRS; with names, specific text strings can usually be requested

`Expert Review (or Designated Expert)` - approval by a Designated Expert is required. The required documentation and review criteria for use by the Designated Expert should be provided when defining the registry.

`Specification Required` - Values and their meanings must be documented in a permanent and readily available public specification, in sufficient detail so that interoperability between independent implementations is possible. When used, Specification Required also implies use of a Designated Expert, who will review the public specification and evaluate whether it is sufficiently clear to allow interoperable implementations. The intention behind "permanent and readily available" is that a document can reasonably be expected to be findable and retrievable long after NRS assignment of the requested value. Publication of a NENA Standard is an ideal means of achieving this requirement, but Specification Required is intended to also cover the case of a document published outside NENA.

`NENA Document Required` – Any NENA document publication.

`NENA Standard Required` – Only a full NENA Standard may specify new values.

`Committee Chair Approval` - New assignments may be approved by the Committee chair(s). Although there is no requirement that the request be documented in a NENA document, the Committee chair(s) has discretion to request documents or other supporting materials on a case-by-case basis.

Committee chair(s) Approval is not intended to be used often or as a "common case". Rather, it is intended to be available in conjunction with other policies as a fall-back mechanism in the case where one of the other allowable approval mechanisms cannot be employed in a timely fashion or for some other compelling reason. Committee chair(s) Approval is not intended to circumvent the public review processes implied by other policies that could have been employed for a particular assignment. Committee chair(s) Approval would be appropriate, however, in cases where expediency is desired and there is strong consensus for making the assignment (e.g., WG consensus).

The following guidelines are suggested for any evaluation under Committee chair(s) Approval:

- The Committee chair(s) can (and should) reject a request if another path for registration is available that is more appropriate and there is no compelling reason to use that path.
- Before approving a request, the community should be consulted, via email to the appropriate mailing list(s) that provides as much information as is reasonably possible about the request.

It should be noted that it often makes sense to partition a registry into multiple categories, with assignments within each category handled differently. For example, registries may be partitioned into two (or even more) parts, where one range is reserved for Private or Experimental Use, while other ranges are reserved for globally unique assignments assigned following some review process. Dividing a registry into ranges makes it possible to have different policies in place for different ranges.

3.2.2 What to Put in Documents That Create a Registry

The previous sections presented some issues that should be considered in formulating a policy for assigning values in registries. It is the working group and/or document author's job to formulate an appropriate policy and specify it in the appropriate document. In almost all cases, having an explicit "NRS Considerations" section is appropriate. The following and later sections define what is needed for the different types of NRS actions.

Documents that create a new registry (or modify the definition of an existing registry) and that expect NRS to play a role in maintaining that space (e.g., serving as a repository for registered values) must provide clear instructions on details of the registry. In particular, instructions must include:

1) The name of the registry (or sub-registry) being created and/or maintained. The name will appear on the NRS web page and will be referred to in future documents that need to allocate a value from the new registry. The full name (and abbreviation, if appropriate) should be provided. It is highly desirable that the chosen name not be easily confusable with the name of another registry. When creating a sub-registry, the registry that it is a part of should be clearly identified.
2) What information must be provided as part of a request in order to assign a new value? This information may include the need to document relevant security considerations, if any.
3) The review process that will apply to all future requests for a value from the registry. Note: When a Designated Expert is used, documents must not name the Designated Expert in the document itself; instead, the name should be relayed to the Committee chair(s) at the time the document is sent for approval.

   If the request should also be reviewed on a specific mailing list (such as a work group list) that mailing address should be specified. Note, however, that when mailing lists are specified, the requirement for a Designated Expert MUST also be specified (see Section 3.1).

If NRS is expected to make assignments without requiring an outside review, sufficient guidance must be provided so that the requests can be evaluated with minimal subjectivity.

4) The size, format, and syntax of registry entries. The defining document must describe any technical requirements on registry (and sub-registry) values (e.g., valid ranges for integers, length limitations on strings, etc.) as well as the exact format in which registry values should be displayed. For number assignments, one should specify whether values are to be recorded in decimal, hexadecimal, or some other format. For strings, the encoding format should be specified (e.g., ASCII, UTF8, etc.). Documents should also clearly specify what elements or sub-elements to record in the registry.
5) Initial assignments and reservations. Clear instructions should be provided to identify any initial assignments or registrations. In addition, any ranges that are to be reserved for "Private Use", "Reserved", "Unassigned", etc. should be clearly indicated.

When specifying the process for making future assignments, it is quite acceptable to pick one (or more) of the example policies listed in Section 4.1 and refer to it by name. Indeed, this is the preferred mechanism in those cases where the sample policies provide the desired level of review. It is also acceptable to cite one of the above policies and include additional guidelines for what kind of considerations should be taken into account by the review process.

Updating the registration process for an already existing (i.e., previously created) registry (whether created explicitly or implicitly) follows a process similar to that used when creating a new registry. That is, a document is produced that makes reference to the existing registry and then provides detailed guidelines for handling assignments in each individual registry.

3.3 Registering New Values in an Existing Registry

3.3.1 What to Put in Documents When Registering Values

Often, documents request an assignment from an already existing registry (i.e., one created by a previously published NENA Standard). In such cases:

- Documents should clearly identify the registry in which each value is to be registered. If the registration goes into a sub-registry, the author should clearly describe where the assignment or registration should go. It is helpful to use the exact registry name as listed on the NRS web page (and defining NENA Standard), and cite the Standard where the registry is defined. Note that there is no need to mention what the assignment policy for new assignments is, as that should be clear from the references.
- Each value requested should be given a unique reference. When the value is numeric, use the notation: TBD1, TBD2, etc. Throughout the document where an actual NRS-assigned value should be filled in, use the "TBDx" notation. This helps ensure that the final document has the correct assigned values inserted in all of the relevant places where the value is expected to appear in the final document. For values that are text strings, a specific name can be suggested. NRS will normally assign the name, unless it conflicts with a name already in use.
- Normally, the values to be used are chosen by NRS and documents should specify values of "TBD". However, in some cases, a value may have been used for testing or in early

implementations. In such cases, it is acceptable to include text suggesting what specific value should be used (together with the reason for the choice). For example, one might include the text "the value XXX is suggested as it is used in implementations". However, it should be noted that suggested values are just that; NRS will attempt to assign them, but may find that impossible, if the proposed number has already been assigned for some other use.

NRS should prohibiting assignment of names or codes on a vanity or organization name basis, e.g., codes are always assigned sequentially unless there is a strong reason for making an exception.

- The NRS Considerations section should summarize all of the NRS actions, with pointers to the relevant sections elsewhere in the document as appropriate. When multiple values are requested, it is generally helpful to include a summary table. It is also helpful for this table to be in the same format as it should appear on the NRS web site.

  Note: In cases where authors feel that including the full table is too verbose or repetitive, authors should still include the table, but may include a note asking that the table be removed prior to publication of the final Standard.

3.3.2 Updating Registrations

Registrations are a request to assign a new value, including the related information needed to evaluate and document the request. Even after a value has been assigned, some types of registrations contain additional information that may need to be updated over time. Example information can include point-of-contact information, security issues, pointers (uri, document number) to updates, literature references, etc. In such cases, the document defining the registry must clearly state who is responsible for maintaining and updating a registration. In different cases, it may be appropriate to specify one or more of the following:

- Let the author update the registration, subject to the same constraints and review as with new registrations.
- Allow some mechanism (annotation) to attach comments to the registration, for cases where others have significant objections to claims in a registration, but the author does not agree to change the registration.
- Designate the Committee chair(s), a Designated Expert, or another entity as having the right to change the registrant associated with a registration and any requirements or conditions on doing so. This is mainly to get around the problem when a registrant cannot be reached in order to make necessary updates.

3.4 Overriding Registration Procedures

Experience has shown that the documented NRS considerations for individual protocols do not always adequately cover the reality after the standard is deployed. In addition, documented NRS considerations are sometimes found to be too stringent to allow even working group documents (for which there is strong consensus) to obtain values from NRS in advance of actual document publication. In other cases, the documented procedures are unclear or neglected to cover all the cases. In order to allow assignments in individual cases where there is strong consensus that an

allocation should go forward, but the documented procedures do not support such an assignment, the Committee chair(s) is granted authority to approve assignments in such cases. The intention is not to overrule properly documented procedures, or to obviate the need for NENA documents to properly document their NRS considerations. Instead, the intention is to permit assignments in individual cases where it is obvious that the assignment should be made, but updating the NRS process just to assign a particular value is viewed as too heavy a burden.

In general, NENA would like to see deficient NRS registration procedures for a registry revised through the NENA document process, but not at the cost of unreasonable delay for needed assignments. If the Committee chair(s) has had to take the action using this section, it is a strong indicator that the NRS registration procedures should be updated, possibly in parallel with ongoing document work.

4 Miscellaneous Issues

4.1 When There Are No NRS Actions

Before a NENA document can be published, NRS needs to know what actions (if any) it needs to perform. Experience has shown that it is not always immediately obvious whether a document has no NRS actions, without reviewing the document in some detail. In order to make it clear to NRS that it has no actions to perform (and that the author has consciously made such a determination), such documents should include an NRS Considerations section that states:

> This document has no NRS actions.

This statement, or an equivalent, must only be inserted after the document authors and the working group has carefully verified it to be true. Using such wording as a matter of "boilerplate" or without careful consideration can lead to incomplete or incorrect NRS actions being performed.

If a specification makes use of values from a registry that is not managed by NRS, it may be useful to note this fact, e.g., with wording such as:

> The values of the [any parameter name] parameter are assigned by the [any registry name] registry on behalf of the [any other forum name (not NENA)] Forum. Therefore, this document has no NRS actions.

In some cases, the absence of NRS-assigned values may be considered valuable information for future readers; in other cases, it may be considered of no value once the document has been approved, and may be removed before archival publication. This choice should be made clear in a draft version, for example, by including a sentence such as:

> [NENA Editor: please remove this section prior to publication.]

or

> [NENA Editor: please do not remove this section.]

4.2 After-the-Fact Registrations

Occasionally, NRS becomes aware that an unassigned value from a managed registry is in use within the 9-1-1 system or that an assigned value is being used for a different purpose than originally

registered. NRS will not condone such misuse; i.e., procedures of the type described in this document must be applied to such cases. In the absence of specifications to the contrary, values may only be reassigned for a different purpose with the consent of the original assignee (when possible) and with due consideration of the impact of such a reassignment. In cases of likely controversy, consultation with the Committee chair(s) is advised.

4.3 Reclaiming Assigned Values

Reclaiming previously assigned values for reuse is tricky, because doing so can lead to interoperability problems with deployed systems still using the assigned values. Moreover, it can be extremely difficult to determine the extent of deployment of systems making use of a particular value. However, in cases where the registry is running out of unassigned values and additional ones are needed, it may be desirable to attempt to reclaim unused values. When reclaiming unused values, the following (at a minimum) should be considered:

- Attempts should be made to contact the original party to which a value is assigned, to determine if the value was ever used, and if so, the extent of deployment. (In some cases, products were never shipped or have long ceased being used. In other cases, it may be known that a value was never actually used at all.)
- Reassignments should not normally be made without the concurrence of the original requester. Reclamation under such conditions should only take place where there is strong evidence that a value is not widely used, and the need to reclaim the value outweighs the cost of a hostile reclamation. In any case, Committee chair(s) Approval is needed in this case.
- It may be appropriate to write up the proposed action and solicit comments from relevant user communities. In some cases, it may be appropriate to write NENA TID.

The reclaiming of previously assigned values would be an unusual circumstance.

5 Appeals

Appeals of registration decisions made by NRS can be made using the normal NENA appeal process Specifically; appeals should be directed to the Committee chair(s).

6 Security Considerations

Information that creates or updates a registration needs to be authenticated and authorized. NRS updates registries according to instructions in published documents and from the Committee chair(s). It also may accept clarifications from document authors, relevant WG chairs, Designated Experts, and mail list participants.

Information concerning possible security vulnerabilities of a protocol or data structure may change over time. Likewise, security vulnerabilities related to how an assigned number is used may change as well. As new vulnerabilities are discovered, information about such vulnerabilities may need to be attached to existing registrations, so that users are not misled as to the true security issues surrounding the use of a registered value.

An analysis of security issues is generally required for all Standards that make use of parameters (data types, operation codes, keywords, etc.) used in NENA documents or registered by NRS. Such security considerations are usually included in the document. It is the responsibility of the NRS considerations associated with a particular registry to specify what (if any) security considerations must be provided when assigning new values, and the process for reviewing such claims.

7 Recommended Reading and References

"Guidelines for Writing an IANA Considerations Section in RFCs", RFC5226, Internet Engineering Task Force, http://tools.ietf.org/html/rfc5226

NG9-1-1 Additional Data Joint Technical/Operations Standard Document (TOSD)
NENA 71-001, Version 1, September 17, 2009

NENA XML Schemas http://www.nena.org/technical-xml-schemas

8 Previous Acknowledgments

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