AMWA SPECIFICATION PROCESS

Introduction

This Specification describes the process by which specifications are introduced and established by the Advanced Media Workflow Association (AMWA). The goals of the AMWA specification process are:

- Interoperability
- Satisfying business needs
- Technical robustness
- Reusability and composability
- Timeliness

The AMWA process is inspired by:

- The Internet Engineering Task Force (IETF) mechanism
- GitHub and other collaborative version control services
- How open-source projects such as Debian/Ubuntu, OpenStack and CouchDB manage release cycles and API versioning.

AMWA gratefully acknowledges their influence.

About AMWA Specifications

One of the AMWA's main activities is to help enable interoperability through the creation of Specifications. AMWA provides several types of Specifications as follows:

- **Application Specifications (AS)**, which constrain a pre-existing standard. For example the AS-11 family of media contribution file formats are built on MXF.
- **Interface Specifications (IS)**, which provide APIs to support interoperability between systems. For example IS-04 (part of the NMOS family of specifications) provides APIs for discovery of networked resources.
- **Data Model Specifications (MS)**, which represent a data model or mapping. For example MS-01 is the AAF object model specification.
- **Best Common Practices (BCP)**, which ratify the community's best current thinking on how to perform certain processes, or provide features. This specification is an example of a BCP. Another example is BCP-003-01 for secure API communications.
- **Informative Specifications (INFO)**, which provide information to the community, for example INFO-001 provides information from an AMWA architectural study on connection and control
- **Historical Specifications**, which have been retired, for example, because they have been superseded.

Note that while some AMWA Specifications may be hosted on the AMWA's GitHub site, the only authoritative source for published and approved Specifications is found at www.amwa.tv/specifications.

AMWA Specifications may consist of a range of entities including "traditional" prose documents, Markdown documents, schemas, software, or other representations, as appropriate. Often such Specifications are also developed and hosted on GitHub (see Appendix A).

Specifications may incorporate **external specifications** by reference, including:

- Due Process Standards, such as those from the ITU or SMPTE
- Open specifications, such as IETF RFCs
- Proprietary specifications, provided they meet AMWA's IPR requirements. AMWA may also require that these are made available as an Informative Specification. AMWA Specifications should not favor a particular vendor's specification over it competitors by making it "required" or "recommended".

AMWA Specification Levels

AMWA makes early versions of specifications available, designated **Works In Progress (WIPs)**. These are suitable for review, feedback and prototyping.

When (and if) work on a WIP reaches sufficient maturity, AMWA makes available an **AMWA Specification**, which is suitable for implementation and product development. It has an identifier of form *[TYPE]-[number]* (e.g. IS-04).

From time to time, the AMWA may label a version of an AMWA Specification as **"Stable"**. This indicates its relationship to other versions and provides assurance to implementers that major technical changes are not anticipated and that future revisions of this version will not break backward compatibility. Stable versions may be enhanced, bugs may be fixed, and documentation may be improved, however.

Specifications may be labeled as “Deprecated” for various reasons, including that they have been replaced by newer versions. Specifications may also be “Retired”, meaning that they are no longer published by the AMWA.

Overview of the AMWA Specification Process

The process of creating an AMWA Specification is as follows:

- A group of AMWA members – *the Proponents* – makes a request to the AMWA Board of Directors – *the Board* – to start work.
- The Board may approve the proposal, approve the proposal with provisions, reject the proposal, or not approve the proposal but provide recommendations for alterations.
- The Proponents develop a Work In Progress (WIP) version of the Specification. (In most cases, WIP is made available to the public.)
- When the WIP is sufficiently complete, has had community review, and there is evidence that it would have value as an AMWA Specification, the proponent submits it to the AMWA Board for approval.

- The Board approves (or rejects) the request.
- Once approved, AMWA assigns an identifier, the Specification is published, and is listed and linked on AMWA's website.
- If appropriate, at a later time, a version of the Specification may be marked as "Stable".

The following sections provide further detail on this process.

Project Authorization

A Specification must be drafted as part of a project approved by the Board, and work may not start until this has happened. In part this is to ensure projects fall within the scope of activities of the AMWA, but it is also to protect AMWA members from making unintended IPR contributions and also to protect them from IPR claims.

To begin the process, a Proponent sends an email to the AMWA Executive Director outlining:

- Project title, the name of the project
- Brief description
- Project Owner, the individual responsible for facilitating the project (see below for more information on this role)
- Proponent organizations, minimum three (including the Project Owner's organization). At least one Proponent must be a Principal or General member, and at least one Proponent should be a user.
- Business purpose, i.e. a clear statement of why the proposed project is important, in business terms. This should include user stories of form: "AS A *role* I NEED TO *requirement* SO THAT *business benefit*".
- Proposed architecture, including how this will fit into the wider architectural aims of AMWA. For example, how it relates to the JT-NM Reference Architecture.
- Deliverables, including — but not limited to — any expected Specifications, and their types.
- IPR Mode Declaration, stating whether contributions may be made on a RAND-Z or RAND basis. See [here](IPR.md) for more information. N.B. The AMWA Board strongly prefers RAND-Z proposals; RAND proposals are unlikely to move forward except in extraordinary circumstances.
- Description of anticipated resource requirements.
- Source of resources. With the exception of board-initiated projects, all AMWA projects must be self-sustaining, meaning that proponents need to marshal the resources required in order to complete the project. This can be in the form of contributions of time and effort from proponents, and/or in the form of cash that may be used by the AMWA to retain personnel who would do the work.

Role of Project Owners

Project Owners are responsible for ensuring that a proposal moves forward and seeing that decisions are made in a timely matter. The Project Owner also empowered to resolve conflicts should they occur (see section "Conflict Resolution and Appeals"). The Project Owner, in consultation with the group working on the project, is responsible for determining when the

project is ready for elevation to AMWA Specification, and is responsible for determining how a Stable label would be applied to the work, if appropriate.

- The Project Owner may be an organization, but the organization must nominate a single individual, whose contact information will be made public, and who has the authority to speak for the Project Owner.

- If a Project Owner steps down, then the AMWA will attempt to locate another Project Owner, first among those who are/were involved in the project, and then within the broader AMWA membership. If a Project Owner cannot be found within six months, then the project will be terminated, and further work on the project under the approved Project Authorization shall not be carried forward.

- The project owner does *not* own the intellectual property resulting from the project or the resulting specification(s); these are copyrighted by AMWA. (The Project Owner *does* retain ownership of any owned and contributed intellectual property, per the AMWA IPR Policy, as does any other contributor to the project. See the AMWA IPR Policy at https://www.amwa.tv.

Project Proposal approval

Once a project proposal has been received, the Executive Director will ask the Board to consider the proposal for approval. The Board may:

- Approve the project as proposed
- Request changes
- Reject the proposal

See the AMWA's By-laws at https://www.amwa.tv for more details on how the Board takes decisions.

Once approved, AMWA lists the project on its website and allows access to appropriate AMWA-sourced resources (Basecamp, GitHub, etc.).

About Works in Progress

It is customary that fairly early on, WIP should be visible to AMWA members and to the public, and comments should be accepted by the project's sponsors.

Any initial contributions made prior to the first meeting of the working group MUST be accompanied by an AMWA IPR Contribution Form which may be found in Appendix A of the AMWA IPR Policy. The language in this form shall not be modified, and emails, letters, or other instruments will not be sufficient.

Similarly, any substantive comments received from non-participants during the drafting of a WIP must be accompanied by a contribution form. This is for the protection of our members.

It is important that the working group does not begin to refer to the work by an AMWA Identifier (e.g. IS-08) without consulting the AMWA Executive Director first.

Note that while it is preferred that WIP be hosted under an AMWA-controlled platform such as Basecamp or in the AMWA section of GitHub, this is not an absolute requirement.

Elevation from WIP to AMWA Specification

The following section describes the process used to elevate Work in Progress to an AMWA Specification:

The Project Owner notifies the AMWA Operations Manager that he or she seeks to elevate a WIP item to AMWA Specification. The Project Owner shall provide the Operations Manager with responses to the following questions:

- What is the proposed specification name and type (AS, IS etc.)?
- How should the proposed Specification be described briefly to AMWA members and the board?
- What evidence is there to attest to the item's value to the field?
- Are there any known, unresolved technical issues?
- Is the item in a state where it is not expected to change, apart from minor fixes and editorial changes? What evidence can be offered to that state?
- Has the Working Group addressed and resolved all design choices? How does the item represent a high degree of technical maturity?
- Is the item well understood by its creators? Is it written or commented in a way that supports comprehensibility by others? Provide a sample or link to a sample of any documentation.
- What notice and opportunity for review has been provided to the community, and what sorts of responses have been received?
- What implementations exist, and/or does the Working Group believe that implementations will be developed in the future?
- What evidence is there of successful interoperation between different implementations?
- What facilities exist for testing interoperability or certification?
- What form(s) does the item take (e.g. prose document, machine readable, code)?
- Where is the item hosted, and what URL should be listed on AMWA's website? (This could include hosting on a code repository service such as GitHub, and linking to a release on that service; an example of this is given later.)
- What is the approach used to version management of the item? Beyond what is presented in this document, what will "Stable" mean? Are there dependencies with other AMWA Specifications, and if so which versions? (See below for more details.)
- What is the IPR Mode of the Working Group developing the item (RAND-Z or RAND)
- Has the existence of any IPR been declared during any meetings? Has any IPR Contribution Form been filed in association with this item?
- Are one or more licenses required to implement the specification? If so, please describe at least two different implementations that have been developed under separate licenses issued by the relevant IPR holder(s).

Not all questions are relevant to all types of specification, e.g. the questions about implementations are more appropriate to AS and IS than INFO specifications. In this case, the Project Owner should state that the question(s) is not relevant.

The Operations Manager:

- Assigns the AMWA identifier and confirms the title
- Issues a Last Call notice of two weeks for AMWA members to review the item. (In the case where dissenting comments are received, they will be referred to the Project Owner for disposition.)
- Ensures that the IPR process has been followed
- Schedules a board vote to approve the elevation.

In the case of Board assent:

- The Project Owner finalizes the item in preparation for publication
- The Operations Manager publishes the Specification

In the case of board objection:

- The Board provides the Project Owner with its reason(s), and with guidance for satisfying the objection(s)
- The Project Owner may again request elevation once the objections are satisfied

Revising Specifications and Version Management

New features

Specifications may be updated to include new "features". Examples include additional functionality of an API, or support for additional data formats or protocols. These are treated as new activities (possibly within the same Working Group), and if the new feature is out of the scope of the original authorization form, then a new project proposal must be prepared and approved using the process above. This is to ensure that participants understand the scope of the group and so that they can comply with the AMWA IPR policy.

The process for introducing new features to an AMWA project include preparing a request for authorization for the AMWA board, to include Proponents, a description of the new feature(s), business purpose, etc. For convenience, this may refer to changes from the original proposal.

The request for authorization is submitted to the AMWA Board and the authorization follows the same process as described above.

The working group prepares a new Work In Progress, and when the new features have been sufficiently developed and tested, the Project Owner notifies the Board that the new feature of the specification is ready to be approved, using a similar procedure to the initial Elevation.

Again, this may refer to the original request, but should also include information about compatibility between versions (see below).

The Board may decide to publish a new version of the existing specification or create a new Specification.

The Operations Manager updates the AMWA website accordingly.

The Project Owner should ensure that the supporting documentation for the Specification provides information about what features are available for each version. A table such as below — which shows (only) a subset of IS-04 features — may be of use:

Feature	v1.0.x	v1.1.x	v1.2.x	v1.3.x
Registration and basic queries	x	x	x	x
Advanced queries		x	x	x
Support for IS-05 device connection management			x	x
Support for future device and transport types				x

Bug fixes

Problems may be found with a Specification that need to be addressed urgently, and can be done so straightforwardly with a small update. Examples include correcting typographical errors in an API or applying security patches. To avoid the delay of authorizing and approving new work, the following procedure may be applied **where appropriate:**

- The Project Owner ensures that the relevant changes are made, including recommending the assignment of a new version number (see below).
- The Project Owner informs the Operations Manager and Executive Director of the availability of the new version, including information about why the change has been made, what has changed, and any implications for existing implementations.
- The Operations Manager publishes the bug-fix version.

It is the responsibility of the Project Owner to determine what is appropriate, and to ensure that such an update does not cause unnecessary compatibility issues for existing implementations, and that any necessary compatibility issues — perhaps caused by an urgent security fix — are well documented.

This bug fix procedure shall not be used in cases where the bug fix causes backward compatibility issues.

Updated documentation

Specifications can be improved, without compromising interoperability, by providing or adding to **non-normative** sections of the Specification's documentation. This may be provided through a minor update, in a similar way to that described above for bug fixes.

Again, it is the responsibility of the Project Owner to ensure that the documentation is correct, and that the update does not introduce backward compatibility issues.

Normative changes, e.g. those that cause API messages or file formats to change — shall not be submitted using this procedure.

Version compatibility

Regardless of how a Specification is versioned, when it is anticipated that different AMWA Specifications will be used together, it is important that potential implementers and users understand compatibility between implementations using different versions of Specification. Project Owners should provide suitable information on version compatibility in the documentation of the Specification. This may need to be accompanied by normative requirements on implementations.

As an example, as of v1.2.x, IS-04 recommends that implementers of its Registration and Query APIs support at least two consecutive versions. In practice this means that a v1.1.x Node can register itself with a v1.2.x IS-04 Registry.

The semantic versioning approach described above provides somewhat stronger compatibility, as all implementations with the same minor number should interoperate.

Designation of a Specification as "STABLE"

Once all anticipated technical development on an AMWA Specification is complete, and once that Specification has achieved a level of adoption and use in the industry, and if the specification has achieved certain milestones as described below, the AMWA Board may decide to assign the designation "STABLE" to that specification. This designation is an indication that the Specification has reached a level of maturity, and that the AMWA is making certain commitments to the industry with regard to that specification, including:

- Work on the Specification is substantially complete, including that there are no unresolved technical issues, and that the AMWA does not anticipate the addition of any major new features.
- To the extent that the Specification has been deployed in multiple implementations, all known major technical bugs have been fixed.
- Testing tools, reference implementations, documentation and/or other artifacts exist and are sufficient to support implementers
- From this point forward, the AMWA Board will not entertain any changes to the Specification that create backward compatibility issues for implementers

- The Specification is "fit for purpose" meaning that it achieves the goals of the original project proposal under which this work was authorized.

The Project Owner is responsible for deciding whether a version should be labeled as "STABLE", although in some cases, the AMWA board may decide to take this action.

Elevation from AMWA Specification to "STABLE" AMWA Specification

The following section describes the process used to elevate an AMWA Specification to a "STABLE" AMWA Specification:

The Project Owner notifies the AMWA Operations Manager that the Specification has met the criteria below and is eligible to be labeled as "STABLE". Note that this label may only be applied to Application, Interface or Data Model Specifications (e.g. AS, IS, or MS).

The request shall include,

- The name of the specification
- A written description of how the Specification meets the requirements below:
    - What significant implementations of this specification exist at this time?
    - Are there examples of successful interoperation between different implementations of this specification? Please describe.
    - Is there a certification authority and certification criteria for this specification? If so, provide information indicating whether a certification process has been initiated and about the status of that process for this item.
    - If there is no formal certification process, are there other relevant interoperability testing protocols, formal or informal? If so, provide information about any interoperability testing of this item.
    - Are one or more licenses required to implement the specification? If so, please describe at least two different implementations that have been developed under separate licenses issued by the relevant IPR holder(s).
    - How does this specification represent a high degree of technical maturity?
    - How does this specification provide a significant benefit to industry?
    - Does this specification include application source code, and/or interface or data definitions that are written in a machine- and human-readable form (e.g. XML, JSON, RAML, RDF), being created in GitHub or other code repository approved by AMWA Board? If so, describe and/or provide URLs or other identifiers for appropriate elements in the code repository. See also appendix B.

AMWA Operations Manager:

- Verifies that the AMWA Specification has been approved for at least six months
- Issues Last Call (not less than two-week notice)
- Schedules a vote by the AMWA Board of Directors
- After approval by the board, adds the notation, "STABLE" to the Specification, publishes the Specification, and announces the elevation to the AMWA membership.

Designating a Specification as "Deprecated"

In some cases to discourage implementers from using an old version of a Specification, it may be appropriate to label it as "Deprecated", meaning:

- Implementers should support a more recent version unless unavailable
- No assurance is provided about compatibility with future versions
- A reference implementation may not be available in the future

The Project Owner is responsible for:

- Deciding whether a version should be deprecated. (**Stable versions shall not be deprecated without the express permission of the AMWA Board of Directors.**)
- Providing notification of deprecation to the AMWA Board including:
- The name of the Specification to be deprecated
- The reason for marking the specification as "Deprecated"
- The name of Specification that replace the specification being deprecated, or alternatively, the reason that the deprecated specification does not need to be replaced
- Ensuring that any GitHub or similar releases includes "Deprecated" in its description (alternatively remove the release from GitHub, and send AMWA a version to be archived)
- Requesting that AMWA mark the version as "Deprecated" on its website.

Retiring Specifications

In some cases, the AMWA may decide to retire a Specification, not merely tag it as "Deprecated".

The Project Owner is responsible for:

- Deciding whether a Specification should be retired (The AMWA Board of Directors may also opt to retire a Specification.)
- Preparing a request to retire the specification, including:
  - The name of the specification
  - The reason the specification should be retired
  - Replacement or alternative specifications

The AMWA Operations Manager:

- Schedules a board meeting to vote on the retirement
- If the vote passes, the Project Owner shall send AMWA a version of the specification so that it may be retired.
- Notes on the AMWA Website that the Specification is "Retired".

Archiving of an AMWA Working Group's "Work In Progress"

From time to time, interest in a piece of work may wane before it advances to the status of AMWA Specification. In this case, since the Work In Progress has not been elevated, none of

the categories (including Retired) above are applicable. However, the work has been visible to members and in some cases, the general public, so it would be inappropriate to have it simply disappear. Additionally, there is always a chance that interest in some work might be rekindled. In this case, it would be appropriate to change the status of the item from Work in Progress to Archived.

Archiving Work In Progress

The Project Owner is responsible for:

- Deciding whether a Work In Progress should be Archived (The AMWA Board of Directors may also opt to Archive a Work In Progress.)
- Preparing a request to Archive the Work In Progress, including:
  - The name of the Work In Progress
  - The reason the Work In Progress should be archived

The AMWA Operations Manager:

- Schedules a board meeting to vote on Archiving
- If the vote passes, the Project Owner shall send AMWA a version of the Work In Progress so that it may be Archived.
- Note on the AMWA Website that the item is “Archived”.

Conflict Resolution and Appeals

Disputes Within a Working Group

Disputes are possible at various stages during the AMWA specification process. The process is designed to maximize the opportunities for compromise and the achievement of genuine consensus. However, there are times when even the most reasonable and knowledgeable people are unable to agree. To achieve the goals of openness and fairness, such conflicts must be resolved by a process of open review and discussion.

An individual (whether a participant in the relevant Working Group or not) may disagree with a Working Group recommendation based on his or her belief that either (a) his or her own views have not been adequately considered by the Working Group, or (b) the Working Group has made an incorrect technical choice which places the quality and/or integrity of the Working Group's product(s) in significant jeopardy. The first issue is a difficulty with Working Group process; the latter is an assertion of technical error. Although these two types of disagreement are quite different, both are handled by the same review process.

A person who disagrees with a Working Group recommendation shall always first discuss the matter with the Working Group's chair(s), who may involve other members of the Working Group (or the Working Group as a whole) in the discussion. In cases where the Working Group chair is not the project owner, the person may subsequently bring up the issue with the project owner. The following section specifies the procedures that shall be followed to respond to AMWA specification-development issues that cannot be resolved through the actions of the AMWA Working Group that is developing the specification.

Appeal to the AMWA Board

If the Working Group cannot resolve the disagreement, any of the parties involved may bring it to the AMWA Board, whose decision is final. The AMWA Executive Director shall acknowledge the receipt of such a request for Board review within two weeks, and shall at the time of acknowledgment advise the petitioner of the expected duration of the Board's consideration.

The Board shall review the situation in a manner of its own choosing and report to the petitioner and to the AMWA Working Group on the outcome of its review. The Board's decision upon completion of their review shall be final with respect to all aspects of the dispute.

Appeals Procedure

All appeals made under the provisions of this section must include a detailed and specific description of the facts of the dispute. Appeals must be initiated within two months of the public knowledge of the action or decision to be challenged.

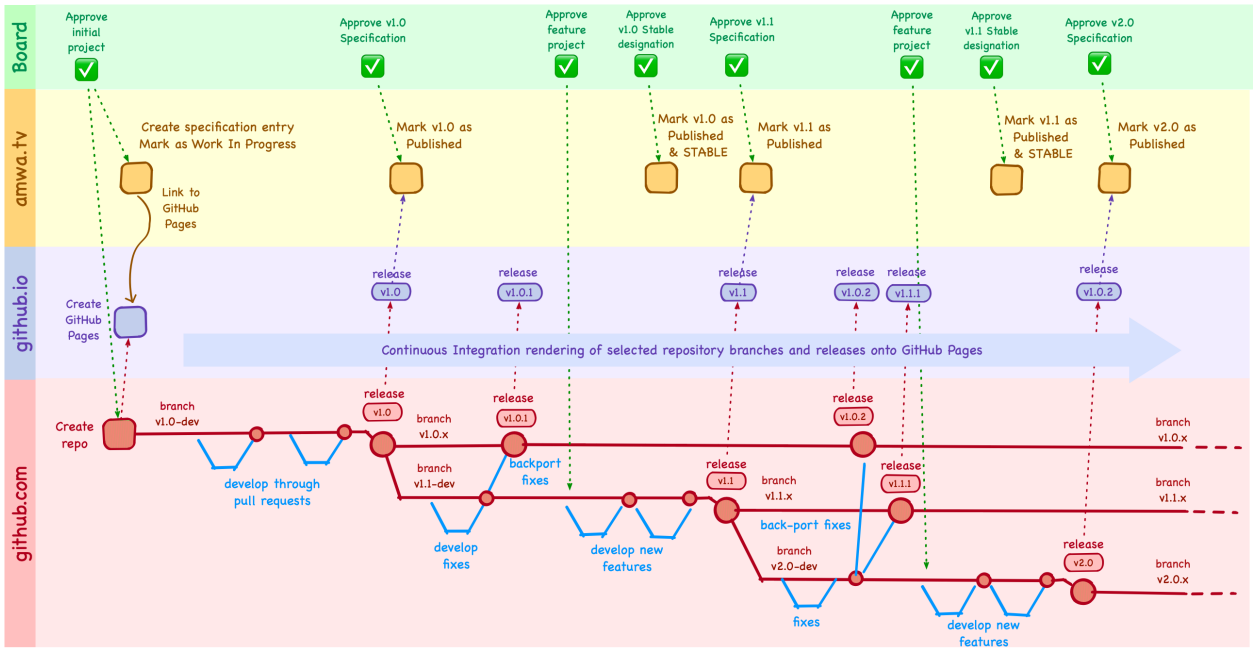
At all stages of the appeals process, the individuals or bodies responsible for making the decisions have the discretion to define the specific procedures they will follow in the process of making their decision. In all cases a decision concerning the disposition of the dispute, and the communication of that decision to the parties involved, must be accomplished within a reasonable period of time.

NOTE: These procedures intentionally and explicitly do not establish a fixed maximum time period that shall be considered "reasonable" in all cases. While there may be times that consensus is key, there may be other times when business or other considerations require quick action. Ultimately, the AMWA Board is responsible for determining the appropriate amount of time required to resolve issues brought to its attention.

Appendix A: Example for a Specification of an API developed on GitHub

Note: This Appendix is informative and is not part of this Specification. It is based on what has been done for several of the AMWA NMOS Interface Specifications. However, there are various different approaches that are used by developers, and it is up to the Proponents to choose a suitable approach for their Specification(s).

The diagram below shows an example in which a Specification for an API is developed and hosted on GitHub or a similar version control-based service.



In this example:

- "Semantic versioning" is used for numbering versions of the API. This has been adopted by many open-source software projects, both for API specifications and the code itself, and is detailed here. In summary:
  - Versions of the API are numbered with `x.y(.z) starting from 1.0.`
  - A change in x is used for new features that may compatibility with previous versions.
  - A change in y is used for new features that do not break compatibility.
  - A change in z is used for bug-fix and documentation updates.
- The Working Group develops a Specification on a public GitHub repository. (In the early stages of the project, the Working Group might keep the repository private.)

    - Work In Progress on developing features, as well as bugfixes and documentation happen in development branches.
    - Published specifications are indicated using GitHub release tags.

    See the NMOS Wiki for more details of the GitHub workflow.

- A continuous integration system automatically builds rendered versions of the specification, and accompanying documentation and examples of this repository for the convenience of readers. These include links back to the GitHub repository.
- Links are provided on the amwa.tv Specification page to the rendered versions.