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HTR-N PROJECT Q.A. REQUIREMENTS

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CONTENTS

1. SCOPE

The document provides for a summary of the main requirements for the HTR-N project [1] Quality Assurance as primarily applicable to the reactor physics computational activities and related guidelines adequate to guarantee reliable and consistent generation, certification, exchange and maintenance of data and information originated inside the HTR-N Project with specific assessments in connection with procedures for documentation processing between the HTR-N Project entrusted Partners.

2. INTRODUCTION

The participation of a large number of Partners in the HTR-N project [1], the need of organising the exchange of data and of constituting referential data systems require to find a common ground for setting up a substantial harmonisation between possibly different working procedures in order the HTR-N Project Partners may be confident they are interacting with the necessary degree of consistency and reliability when performing their common activity in the Project.
To this purpose it is then necessary to define general guidelines for the organisation and management of DB's, data entry and updating, retrieval and dissemination of data through, to the extent possible, automated procedures, as well as procedures for the HTR-N documentation preparation and processing which may be the most suitable and harmonised between the different Partners organisation, while being considered responding and qualified in the framework of the ISO 9000 [2] standard.

When considering the substantial contents of the activity, it is noted that the main HTR-N Project features may be summarised in the following:

- participation of many different Partners using different Q.A. Procedures
- use of many different Computer Programs for modelling/calculations (see list in Appendix A of ref. [3])
- use of many different Data Sets (DB's, nuclear libraries, references)
- complex flow of documentation and data/info's exchange between Partners

Under this perspective, it is at the same time recalled that the basic aim of a Q.A. system is to assure, both for Project Activities and final Product (which is constituted by the deliverable documents in the case of the HTR-N Project):

a) the inherent consistency among the different parts relevant to the Project (data/info, methods, processes)
b) the reliability and traceability of contents and applications

When dealing with a Q.A. system, the following project topical activities are considered relevant as object for specific requirements and regulation:

1. project input and analysis methods
2. design-analysis check/control
3. filing system
4. data/information transfer management and control

Whereas the specific objectives for a Q.A. regulation in the HTR-N Project may be summarised in the following:

1. validation of referential correctness and consistency of data sources
2. check/verification of the inherent correctness in the design-analysis process
3. ensuring the traceability of data and methodologies used
4. supporting the reproducibility of the obtained results
5. qualification of the project activity as useful knowledge and valuable reference for future works and transfer to possible applications

It is noted that when operating in agreement and consistently with a selected Q.A. system, i.e. the ISO 9000 in this case, the different organizations which are participating to the RTD project do not need a specific certification themselves, being their current standards acceptable in that they may be supporting and in substantial compliance with the required project Q.A. system.

3. DEFINITION OF THE HTR-N PROJECT Q.A. FRAMEWORK

The focusing on the main requirements for the HTR-N Project Q.A., after having submitted to the HTR-N Partners a first proposal [3], has been evolved through a few of interactions:

1. elaboration of a first document draft on “Additional Q.A. Guidelines” (Dec.2000);
2. presentations and discussions at the 2nd and 3rd HTR-N PMM’s (March-October 2001);
3. comments provided by Partners in writing and at the 3rd PMM (October 2001) mainly, by WPM-3 and PM.

This substantially helped a better understanding on how it would have been more convenient to organise the relationship and interaction between the different Partner organisations in that the Q.A. process and procedures may be affected and to develop suitable Q.A. procedure guidelines specifically tailored on the HTR-N needs and goals.

The most substantial remarks raised by the Partners were mainly dealing with the HTR-N Project documentation cycle processing, with attentive and sensitive observations intended to underline and affirm the primary role of a contributing Partner in the document preparation and approving process according to his internal Q.A. procedures.

In this connection, it has been actually considered that such kind of a remark may be practically addressed based on same principles already set forth in the basic Q.A. guideline document [3] while combining with requirements stemming from the PMM’s discussion.

A first proposal for the HTR-N Q.A. bases and framework has been submitted to the Partners on occasion of the 4th PMM in November 2001 [4].

3.1 The HTR-N Q.A. Bases

The main outcome is that the HTR-N Q.A. system can be considered founding on the following grounds:

I the HTR-N Partners are credited to operate in agreement with and under a Q.A. system (consistent with ISO 9000)

II under this principle, the different organizations participating in the RTD project do not need specific certification themselves, so that:

their current standards may be acceptable under the ascription that they are supporting and are in substantial compliance with the required Project Q.A. system

III it has been agreed (3rd HTR-N PMM) that the HTR-N Partners will adhere and apply their own internal system of Q.A. rules when performing activities in connection with the HTR-N project

The necessary additional Q.A. rules will be then applied as a regulation body for conformity control at the HTR-N Project level, with the aim of organising the Partners intervention and their interaction under the perspective of the basic Q.A. principles as summarised in Section 2 above.

3.2 The HTR-N Project Q.A. Framework

The former findings have led to the necessary and practical outcome of acknowledging a HTR-N Q.A. system based on a double context:

1. the Partner organisations Q.A.:

   this Q.A. system is of strict competence and responsibility of the Partner organisation which leads a given activity and that eventually issues the related documentation;

2. the HTR-N Project Q.A.:

   this Q.A. system pertains to the HTR-N Project as a whole through the interaction and concurrence between the Project Partners.

Since each of the two contexts has established its own, most suitable, Q.A. environment and is assumed to operate to its rules accordingly, the harmonisation of the two systems on a consistent basis may be accomplished through the adoption of different levels of Q.A. classification.
It is in fact customary in Q.A. organised environments to apply different Q.A. levels (most commonly 2 or 3, depending on the specific sector and/or activity an organisation is working on) according to the specific requirements to which a given final product or activity shall eventually comply with.

It may be suitable to identify not more than 2 grades of Q.A. classification for the HTR-N Project case to be applied to both organisation systems (or contexts), Project Partners and HTR-N Project. The following convention is then proposed in order to distinguish the 2 Q.A. contexts:

1. the Partner organisation Q.A. system grade: level A or B
2. the HTR-N Project organisation Q.A. system grade: level 1 or 2

where levels A or 1 are more restrictive, i.e. of higher degree, than levels B or 2.

Under these assumptions, it must be remarked that :

- whereas it is responsibility of the Partner organisation to comply with a chosen Q.A. level and then to assign, on a case by case basis, the issuing document to a Q.A. grade as A or B

- it will be competence of the HTR-N Project to undertake the Q.A. process which will eventually classify as of level 1 or 2 the documents produced by the Partners when approving them as HTR-N Project documentation

Besides following his own Project procedures, the HTR-N Q.A. context shall have his own forms for applying the Q.A. system. Figures 1-2 report the proposed HTR-N Project general forms for first and second page respectively (HTR-N 01 and HTR-N 02, an added */form rev.number* to the string right side indicates the currently applicable form revision).

3.3 The HTR-N Project Forms

3.3.1 Cover Page (Form HTR-N 01)

The first page, HTR-N Project cover/front page, must be always applied for issuing documents under the HTR-N Project (EC project FIKI-CT-2000-00020), be these either EC deliverables or other support documents prepared and issued by Partners for the HTR-N Project activity.

Figure 1 shows the HTR-N 01 form which shall be attached in front of any document provided by any of the Partners organisations to the HTR-N Project. The HTR-N 01 cover page form enlightens the following features and criteria:

a) for displaying purposes, both the EC and the HTR-N logos have been arranged on the page top;

b) the explanatory fields implemented on the front page may be considered as the minimum necessary for the context of the HTR-N Project Q.A. system;

c) the fields are unequivocally identified, their position is not critical, rather represents a convenient grouping of the HTR-N indicators (some of the Ansaldo Q.A. certified forms have been taken as model);

d) the agreed form formats shall be kept by all the HTR-N Partners as final (in case of need of form revision the */form rev.number* indication shall be progressively increased (e.g. from HTR-N 01/1 to HTR-N 01/2).

The front-page form HTR-N 01 displays the relevant information for:

1. <u>the HTR-N project</u>: Work Package, Task, document number, document type, Q.A. level, document status, dissemination;
2. <u>the original issuing Partner document information</u>: Partner acronym, original document number, number of pages (to be indicated in the “Annex pg.” field **<u>only if</u>** the original Partner document is enclosed, in this case the number of attached page automatically appear on the HTR-N forms right footer), revision number, Q.A. level;
3. <u>document references</u>: title, author(s), organisation(s), country(ies), and notes on filing system and other information as needed;
4. <u>document history</u>: on the page lower grid, the revisions bottom-up tracking under the HTR-N Project Q.A. system (Rev. numbers, dates, short issue description);

   in addition to these data, the lower grid of the front/cover page shows the following key information for the HTR-N Project documentation:

5. the revision number;
6. the date of issuing, typed as day/month/year;

7. a short description ("first issue" for Rev.0, short wording for following revisions, synthetically defining the need for it);
8. the acronym of the Partner organisation(s) which has submitted the document;
9. the acronyms of the Partner organisations which have examined the document, expressed their comments, proposed amendments and/or the acronym of the Partner organisation which performed the review under the HTR-N Project Q.A. system (*"n/a*", not/applicable, is typed in case of level 2 Q.A. processing);
10. Partner organisation acronym and personal name of the WP manager that perform the check/control of the document according to eligibility principles for the given WP Task;
11. Partner organisation acronym and personal name of the Project manager that endorse and approves the issuing of the document as a HTR-N Project document and its eventual release as deliverable to the EC.

The HTR-N 01 form, together with the HTR-N 02, has been encoded in a Word97 template which shall be made retrievable at the SINTER site for the HTR-N Project entrusted Partners.

The form number, HTR-N 01 or HTR-N 02, is indicated on the footer left side; when the form are revised (as depending on needs from practical experience and/or intervening changes on some of the fixed parts of the templates, such as the logos) the form revision indicator "/n" is incremented starting from 1.
The initial form number are then HTR-N 01/1 and HTR-N 02/1 for the cover and second page respectively.

3.3.2 Second Page (Form HTR-N 02)

The second page, HTR-N Project second page, must be always applied for issuing documents under the HTR-N Project, be these either EC deliverables or other support documents prepared and issued by Partners for the HTR-N Project activity.

Figure 2 shows the HTR-N 02 form which shall be attached just after the HTR-N Project front-page (HTR-N 01 form) prior of any document provided by any of the Partners organisations to the HTR-N Project. The HTR-N 02 second page form contains the "Chronology and history of revisions" table, which summarise all the revision the document underwent with the description of reason and needs for them, enlightens the following features and criteria:
Where applicable or when needed, other pages based on the HTR-N Project second page form (HTR-N 02) may be attached as following pages.

Therefore, the second page form HTR-N 02 is for using in the pages following the cover: more specifically as the second page contains the document revisions chronological history, this page must be always used as complementary to the first one and, in practice, it will always follow the document, being constantly updated as document is revised, by keeping track of his history.

Conversely, any other following page may be optional, depending on document structure, and will be constituted by the second page form HTR-N 02 without the chrono-table.

In compliance with the basic principles of the HTR-N Project double context Q.A. set forth in Section 3.2, two basic type of document structure are foreseen, possibly extending the use of the second page, HTR-N 02 form:

a) HTR-N Project document incorporating the original Partner document, i.e. the formed by the cover page and the second page of the HTR-N Project (compiled forms HTR-N 01-02), plus the attachment of the original Partner document, as issued in the Partner organisation Q.A. context and adhering to its consistent forms (in this case the number of attached document pages must be indicated in the "Annex pg." field of the cover page form HTR-N 01);

b) HTR-N Project document issued according to the HTR-N Project Q.A. context and all consistent with the HTR-N Project forms (e.g. Project management documents – but this does not prejudice they can also follow procedure as per point (a) above): from the third page and following the HTR-N 02 form is used (the "Annex pg." field of the cover page form HTR-N 01 must be left or, better, typed with "no" if no Partner original document is attached).

The second page form, HTR-N 02, displays the relevant information for:

1. Work Package and Task, the HTR-N document number, the type of document, the revision number;
2. page numbers on the right side at the foot-page (the total number of pages is shown in both cover and second page forms), the number of pages is indicated as cover + second HTR-N Project pages + No. of pages of the Partner's attached document when this case applies.

3.3.3 HTR-N Documents Qualifier

The cover page form must contain some key information which are actually qualifying the document identity and status:

1. dissemination level of the document, 3 options are foreseen:
   a) **CO** - confidential, document distribution is restricted to the HTR-N Partners only
   b) **RE** - restricted, document distribution is restricted to Partners + HTR-N credited observers
   c) **PU** - public, open to unrestrained distribution

2. document status, 3 options are foreseen:
   a) **Draft** - the document is still under the drafting/editing stage, substantial changes may still be possible;
   b) **Review** - the document is either under revision by Partners other than the issuing ones for comments/amendments, or under endorsement of the HTR-N Project WP manager & Q.A., limited changes are possible;
   c) **Final** - the document is fixed after approval of the coordinator Partner (the HTR-N Project manager): any modification to it will require to go through the revision process and Q.A. validation; updating of the Revision number on both HTR-N 01-02 forms will be required with addition of another string record in the lower grid on the HTR-N 01 cover page.

3. different options may be available for document type, the main distinction should consider 2 principal document categories, deliverable and general project document:
   a) **deliverable** - contractual document are the Deliverable reports, the PMM Meeting minutes and the Progress reports: these is reflected through the numbering convention by the letter codes **D**, **M** and **P** [5];
   b) **support** - general HTR-N Project documents which do not represent in themselves due deliverables but Support documents for general information on HTR-N or background references to specific Project deliverables, may be instead grouped into a number of types such as: report (generic), management, data set, drawing, test specification, methodology, simulation/calculation note, Q.A. procedure, etc, all these is reflected through he numbering convention by the letter code **S**.

Conformity control of this information and of the relevant qualifiers is responsibility of the WPM as for the document coherence inside a given WP and of the PM as regards the general coherence of the document inside the HTR-N Project and its conformity according to the HTR-N Project requirements and goals as these have been set forth by Annex I [1].

3.3.4 HTR-N Documents Classification

The classification of the HTR-N Project documents is identified according to the following coding:

HTR-N-yy/mm-X-W.T.N-P_R where:

- yy is the year of issue
- mm is the month of issue
- X is the letter code, D, M, P for deliverables, S for support documents (see point 3 in section 3.3.3)
- W is the WP number
- T is the WP Task number
- N is the Deliverable number for a given WP and Task
- P is the progressive number of the document for a given WP, Task and Deliverable
- R is the revision number given in two digits (i.e. _00, _01, _02, etc): this identifier is for archiving purposes in SINTER, not for indication in the document number on the cover and second pages themselves.

The revision number of the document is indicated in the appropriate fields of forms HTR-N 01-02, as described in above sections 3.3.1-3.3.2.

The HTR-N Project PM has the prime responsibility of defining and maintaining a list for attribution of document numbers so that these will be unambiguously identified without any possibility for double attributions or mix-ups between different documents. He will also inform the WPM's about the coding of the HTR-N numbering system and rules for assigning the documents number.

When drafting a HTR-N document and, in any case, before releasing copy to outside, even if still in the draft form, the Partners shall ask the HTR-N PM (and/or the WPM in charge) for the relevant HTR-N Project number to be typed on the document.

The HTR-N PM defines a document number from the list, updates the document list as necessary, communicates the document number (and, eventually its revision number) to the Partner(s) which requested for it.

The document list may be conveniently maintained as a readable only electronic file in the same SINTER section area where all the final issue HTR-N Project documents are maintained under **CO**, i.e. the confidential requirement privilege which make them accessible only by the HTR-N Partners by reading only.

4. HTR-N PROJECT DOCUMENTS ISSUING PROCEDURE

4.1 Basic Structure for HTR-N Project Documents Issuing Procedure

Based on the HTR-N Q.A. framework (Section 3.2), Partners are generally expected, as a principle rule, to firstly issue their documents according to their own Q.A. System and Forms inside their organisations before submitting the documents to the HTR-N Project.

After having issued the document as an its own original, the issuing Partner organisation submit the document to the HTR-N Project. The HTR-N Project cover page (form HTR-N 01 + HTR-N 02 with the revision chronological table) is then attached in front of the document (for practical reasons, this should be done initially by the issuing Partner) before the document is going to be sent through the Q.A. process (level 1 or 2, as needed) inside the HTR-N Project context.

The functional relations in the two-contexts Q.A. system is outlined in the following scheme, which enlightens for each of the document preparation-issuing step the Q.A. relevant action inside both the Partner organisation and the HTR-N Project:

	Organization Context		
***processing step*:**	**Partner Organization**	**HTR-N Project**	
preparation	Working Draft	*WP's & Project Manager* acquisition & editing into HTR-N Project forms	
	technical adequacy for application, assumptions, references and assessment	***Level 1 Q.A.*** *(HTR-N Project deliverables and related documents)*	***Level 2 Q.A.*** (*generic support documents, not deliverable related)*
verification	check / control	*Partners[1] Review for* comments&amendment and/or Peer Review	
conformity control	*level A/B (A. for deliverable related documents)* Q.A. attribution *as per review extension applied*	*WP Manager & Q.A..* Control & Q.A. *consistency requirements*	
endorsement & emission	*Partner management:* approval & issue for release to the HTR-N Project	*HTR-N Project Manager:* approval & issue for release to EC and to dissemination	

As apparent, this scheme does not support Partner-to-HTR-N Project delegation in internal document processing Q.A., that is no arrow is connecting intermediate stages between the two context columns. They would not be in fact advisable for both formal aspects, eventually leading to implication of the HTR-N Project in the Partners' internal Q.A., auditing, etc and practical convenience: an ad hoc structure and resources should be made available at the Project level to that end.

[1] other than those involved in the document preparation - issuing in the Partner Organisation context

For practical purposes and for speeding up the issuing process, when the document is still in the Working Draft status under the issuing Partner's organisation Q.A. system, other potentially interested Partners may be asked to provide for comments on the document before the issuing Partner Q.A. process is completed and the document formally released to the HTR-N project.
Therefore, if the drafting/issuing Partner considers the pre-release of the document may be convenient for getting an early clearance before the document goes under the review stage in the HTR-N Q.A. system processing, the draft is sent to the HTR-N WPM, who will distribute the document to the Partners whose concurrence is judged relevant in the perspective of the review stage inside the HTR-N Project Q.A. process.
However, it must be underlined that consulting other Partners before the document is officially released should not be considered as a formal action in the Q.A. process, otherwise it would appear as if other Partners may be entitled to enter the QA system of the drafting/issuing Partner.

In this connection, it must be underlined that the document drafting/issuing responsibility stays with the drafting/issuing Partner, which goes through the processing steps, assigning the applicable Q.A. grade A or B, as per the "Partner Organisation" column in the above scheme.
Mix-up of role and/or responsibility between the two systems above (i.e. between the "Partner Organisation" and the "HTR-N Project" column contexts) must be avoided, or an unmanageable procedure and intricate Q.A. would result.

When the document is formally sent to the HTR-N Partners for review (required for Level 1, not needed for Level 2 – support documents/others), the document must be in the final form and cleared according to Drafting/Issuing Partner Q.A. system. In case of comments/concurrence of the non-drafting/issuing Partners is already obtained meanwhile, their review may just represent a formal, but due, action for confirming their technical review acceptance.

The technical review may be performed at different levels of discernment, according to needs and relevance of the document. In case the WPM and/or the PM considers that a Peer Review is appropriate, they may as well assess (also based on resources available) which are the documents worth for reviewing and, eventually, for re-calculations by alternative methodologies.

The last steps of the issuing process in the HTR-N Project system are the control of the document by the WPM according to the consistency with the given WP requirements, as well as the general Q.A. aspects, and the endorsement of the document by the PM according to the general HTR-N Project conformity requirements and goals as based on the contractual aspects set forth in the technical Annex I [1].

4.2 HTR-N Project Documents Issuing Procedure Description

The different processing steps of the document issuing procedure may be summarised as follows (refer to the scheme in previous section 4.1):

1. the D/I Partner prepares the Draft document inside its Organisation and in compliance with its own Q.A. requirement; the D/I Partner considers and decides whether or not early comments and/or concurrence of other HTR-N Partners may be convenient or advisable before issuing the document;
2. if so, the D/I Partner notifies by E-mail a Working Draft copy of the document to the Work Package Manager and HTR-N Project Manager; the WPM fills up and attaches the HTR-N forms with “Draft” status in front of the WD for insertion in an appropriate SINTER database area (identified as DB#3 in reference [3]) and informs the potentially interested Partners where they may have access in the SINTER DB section for retrieving copy of the WD and for inserting their comments (these may be either list of comments referencing the WD and drafted on a suitable “ad hoc” HTR-N Q.A. form (checked-list/review report), or marked-up copies of the WD) when their review is completed;
3. the reviewing Partners either provide comments on the WD document directly to the WPM or inform him that they have inserted their reviews on the document WD in SINTER, the WPM then collects and send them, with his own eventual remarks, to the D/I Partner (or address them through SINTER);
4. the D/I Partner considers Partners’ comments and processes them as per its own judgement/needs (as this step must be still considered as an informal consulting of the HTR-N Partners), proceeds on its own document internal review and approval to get the final issuing status as per its own internal Q.A. process and procedures (the document forms must be those of the D/I Partners);
5. when the document is formally issued inside its own Organisation, the D/I Partner notifies and sends copy of the document to the WPM and HTR-N PM by E-mail;

from this point onward the document is under the HTR-N Project Q.A. system (right double-column in the above scheme):

6. the WPM attaches on the document the HTR-N forms (i.e. HTR-N 01 and HTR-N 02, the cover front page with the chronology table, for practical reasons, these should be already provided by the D/I Partner), fills up all the fields and, with the concurrence of the HTR-N PM, addresses the HTR-N Q.A. level to be attributed to the document, that is level 1 or level 2;
7. if the HTR-N Q.A. level has to be “1” (“*level 1 Q.A.*” column in the scheme) the WPM selects a number of Reviewing Partners and, based on their specific interests and competences, as these relate to the subject and different aspects of the document review, notifies copy of the document to them by E-mail, requiring specific review tasks: these may be different for Partners sharing different review aspects (a suitable “ad hoc” HTR-N Q.A. review form, check-list type, may be useful for that purpose); even if the document has been released as final issue in the Organisation of the D/I Partner, it has the Review Document status in the HTR-N Q.A. system, so that the HTR-N cover form (HTR-N 01) attached on it must show “Review” in the status field: this is required for obtaining the Q.A. level 1 under the HTR-N system;

8. the WPM (or the PM) inserts copy of the Review document in an appropriate SINTER database read-only section (which may be identified as the DB # 4 area of reference [3]); if an “ad hoc” HTR-N Q.A. review form (check-list) is used, this could be eventually attached to the RD; the Reviewing Partners may also retrieve copy of the document to review with their assignments from this section but, in any case their formal appointment and scope of review should formally be done directly by the WPM by E-mail;

9. under the HTR-N Q.A. Review system, the Reviewing Partners provide their comments and suggested amendments on the RD to the WPM; the Partners’ comment lists may be drafted on a suitable “ad hoc” HTR-N Q.A. form (checked-list/review report) which may be attached to the marked-up copies of the RD); in case of comments/concurrence of the Reviewing Partners has been already obtained through steps 2-3 above, by this step they formally release their technical review acceptance for the RD.

   As a minimum, the technical review should examine whether the following topics have been discussed and/or fulfilled:

   - scope of the study
   - background knowledge
   - problem/purpose
   - applicable standards
   - referenced input data sets
   - rationales and justifications for input data not supported by adequate references
   - analyses tools and methods: computer programs, DB’s, calculation assumptions
   - results and discussion
   - references

10. depending on the document, the technical review may be performed according to different levels of relevance: in case the WPM and/or the PM consider that a Peer Review is appropriate for the RD, they may also require this kind of reviewing together with, eventually, a specific type and scope of re-calculations by alternative methodologies (computer programs and/or nuclear libraries);

    Further to the above check items, the peer review should also consider:

    - reasonability of assumptions, methodology and approximations
    - document consistency on internal cross-check and to external references
    - calculation consistency (extent to be defined)

11. just in case of major issue comments on the RD, the WPM addresses the RD to the HTR-N PM for requiring the concurrence on document revision: if agreed, the HTR-N PM sends back the document to the D/I Partner for revision, as necessary: the issuing Partner then provides for the document technical revision according to the internal Q.A. procedures of his own Organisation;

12. the WPM checks the RD for general consistency as per the given WP requirements, as well as the HTR-N Q.A. system aspects (possibly, with the support of a Q.A. controller): in practice, this should be done in synchronism with the technical review acceptance as per steps above;

13. as notified by the WPM, the HTR-N PM approves the document for endorsement as a HTR-N document according to the general HTR-N Project conformity requirements and goals as set forth in the technical Annex I [1], changes the HTR-N document status from “Review” to “Final” and inserts the FD into the SINTER database section area reserved for the final HTR-N documents only;
14. HTR-N PM releases the HTR-N FD according to the CO-RE-PU level of dissemination: the SINTER HTR-N Final Documents area sections must be accessible (by reading only) by the different organisations according to their specific eligibility to the relevant section of the SINTER DB.

In case the required HTR-N Q.A. level is “2” (“*level 2 Q.A.*” column in the scheme) the above processing steps from 7 through 13 are skipped and the document may be directly released by the PM as a lower level 2 Q.A. HTR-N Project document which does not require specific reviews by the HTR-N Partners. While the check/control of the WPM (processing steps 12-13 above) is not strictly necessary for level 2 Q.A. (the WPM can always sign, in any case, for better completeness), the endorsement of the HTR-N PM is always necessary for approving the release of a document inside the HTR-N Project system.

5. THE HTR-N PROJECT Q.A. SYSTEM AND THE SINTER NETWORK

One basic aim of the HTR-N Project, as regards the Q.A. system, is to develop a basis of rules and document processing procedures which might be substantially embedded within an electronic environment being organised by means of the SINTER Network [6]. The SINTER Network is implemented, managed and maintained by the University of Stuttgart, it accounts for more than one hundred organisation from nearly twenty countries (for a total of four hundreds users) working in many different projects in the nuclear field.

The HTR-N Project Q.A. system should be organised such that the HTR-N Project can be directly addressed in the SINTER environment and based on a straight framework of four main areas of different DB's typology [3]. Each area may include different sections and sub-sections as per the specific needs of that DB area. The different areas and sections should be connected through a logical threading pattern for fast recognition and reliable access to the information of interest.

A basis of four areas, or main DB categories, are considered from reference [3] :

1. <u>HTR Technology references and Bibliography (TB-DB)</u> : this DB area is a collection of documents and papers representing the HTR technological background, with particular relevance to the neutronics aspects, from different R&D programs as well as operating experience from the management of power reactors; the DB has to implement an hypertext index for fast access through selection of specific document properties and keywords; this DB area may be organised in sections for addressing different subjects (it could be in fact a virtual area addressing documents of "N" interest but "physically" contained in another, much more comprehensive, DB).
   This DB area should be controlled by the HTR-N PM and accessible in writing by the DB administrator, while the HTR-N Partners and credited observers have access by reading only through an user-id and password;
2. <u>Nuclear data and Libraries (NL-DB)</u> : both open and commercial nuclear data libraries are generally fixed and accessible by reading only when used for performing calculations, so that consistency and traceability requirements are fulfilled for analyses addressing same library type/version. It has been assumed that the standard common NL-DB's are currently kept and maintained at the Partners' organisations and governed by the internal Q.A. of the Partners. This DB area may effectively organise the sharing between Partners of particular nuclear data and libraries which are specific for the HTR system, the standard NL's implementations for specific tools and calculation methods, the sharing of computer programs tools and NL's to be eventually made available under specific provision agreement for the HTR-N Project Partners. This DB area may be organised in different sections to address the above-mentioned nuclear data, tools and NL's types: in this case the certification shall be processed as per the HTR-N Project Q.A. context [3].
   This DB area should be controlled by the HTR-N PM and accessible in writing by the DB administrator, while the HTR-N Partners have access by reading only through an user-id and password;
3. <u>Data/information Exchange DB (DE-DB)</u> : this is a working DB area for Partners to exchange computer programs input/output, information and documents; one computer programs section with an "input" sub-section may be used for implementing information and common data sets useful for building the computer programs base decks and for

exchanging the base decks themselves, while an "output" sub-section may collect the computation results according to an agreed common data set [7] enlisting all the parameters useful for carrying out intercomparisons. Another section of this DB may be used for exchanging information on calculation methods and cases, the best references to be used for common input parameters values in calculations, as well as for discussions on these subjects and forums. A specific section/sub-sections may be reserved for exchanging WD's of documents under preparation by different Partners and for early commenting of WD's submitted by a D/I Partner while these are still in the process of approval under the Q.A. system of its Organisation (see points 2-3 of chapter 4.2).
In principle, Partners should have access also to this DB area by reading only in order to avoid/limit misoperations, the need of interaction being allowed through a limited writing permission which consents inserting files in the section/sub-section of this DB area but not deleting, or otherwise modifying, those files which are not originated by the same Partner (recognised by the system through its user-id and password) : for keeping track of the file history and improving transparency, an automatic electronic procedure in the SINTER system should assign a log to each file which records some basic information on the file (date of creation, access dates, updating/change dates, Partner Organisation acronym, name of the Partner representative); while the HTR-N WPM's and PM may be allowed for some more privileges, depending effective needs, one responsible only, the DB administrator, can have (under the PM control) full-writing rights, as required by basic Q.A. rules on electronic DB's management;

4. <u>HTR-N documentation Processing&Archive system DB (PA-DB)</u> : this DB area is mainly for processing the documents prepared by the Partners according to the HTR-N Project Q.A. system and for archiving the documentation issued in the HTR-N Project, so that two main sections should be included in this DB area; a first area section would supply the environment for processing the Partners' documents (RD) according to the HTR-N Project Q.A. procedure described from point 7 to 12 in previous chapter 4.2 (i.e., document review + control) : as it may be foreseen that many different RD's may be simultaneously under the approving process, this area section should allocate different sub-sections, one for each document under review-approval, identified by the same HTR-N document number. Copy of the review forms to be used in the review-approval process may be maintained in this area section for retrieval purposes (reading only): the review forms filled-up, for a given RD, by the WPM for requiring specific review tasks to the reviewing Partners, may be inserted together the original RD in the relative RD area sub-section.
A second area section of this DB supplies the archive for the HTR-N FD (steps 13-14 of the HTR-N Q.A. processing procedure of chapter 4.2): in order to comply with the three dissemination levels (CO-RE-PU) foreseen for the HTR-N Project, this section should be organised in three subsections, one for each level of release. This second area section should also contain the archiving for the progress reports and meeting minutes.
Similarly to previous DE-DB, the Partners should have limited access (once only, for those who are involved in the review process) to the document processing section/sub-sections area for inserting their review (marked-up RD) with the accompanying review form (step 9 in 4.2); all the Partners have the reading only access to the document processing section/sub-sections area; the allocation of the different sub-sections may be addressed by the WPM, who may create a new one to insert a RD when this is sent for review/approval by a D/I Partner: these sub-sections should be permanent as they would ultimately collect all the reviews supplied by the non-D/I Partners and the WPM check/control for consistency and Q.A. requirements, i.e. would maintain track of the HTR-N documents certification according to the HTR-N Q.A. system.

The HTR-N FD archive area section should be accessible by reading only, while the DB administrator only should have (under the PM control) full-writing rights; the three sub-sections for the CO-RE-PU dissemination levels should be transparent to the user, i.e. the system would automatically address the reading rights according to the identification of the user privileges (i.e. Partners would simultaneously access the three CO-RE-PU sub-sections, credited observers the RE-PU levels, general user the PU only).
Similarly to the DE-DB, for keeping track of the file history and improving transparency, an automatic electronic procedure in the SINTER system should assign a log to each file, but with a different procedure as in this case the RD's and FD files are supposed to be accessed only once in modification (i.e. when they are created): records would be then some basic information on the file (date of creation, Partner Organisation acronym, Partner's author, status, etc).
A hypertext archiving system should be implemented for fast search and retrieval of the HTR-N FD's.

The life of the DB's specific to the HTR-N project has to be assured, as a minimum, for all the project duration.

The HTR-N final documents should be archived in the PA-DB/Section_FD by file names based on the HTR-N documents classification indicated in chapter 3.3.4 by the coding convention H T R - N - y y / mm - X - W . T . N - P _ R . As mentioned, the "*_R*" code should be actually used in the document file name for fast identification of the most updated applicable revision of the document when retrieving the file from the FD archive.
The HTR-N FD should be in a non-modifiable electronic file format, such as an Acrobat file format with restricted, password generated, modification privileges or in some image file format (but these usually require much larger file sizes).
However, the original Word Processor file format has to be archived and maintained for possible future revisions of the document. This could be done in a sub-section of the PA-DB/Section_FD area, which should be accessible to the WPM and PM by reading only and hidden to the other HTR-N Partners.
The PA-DB/Section_FD area section should contain a complete document list of FD with a number of information such as author(s), document title, D/I Partner, etc (those which are not issued yet, but earmarked for future emission). This list would be updated from time to time by the PM (who would be enabled of writing/modifying rights on it) and should be maintained under the CO area subsection where the Partners only may have access by reading only.

Similarly to the FD files, the RD files would be processed in an area section like PA-DB/Section_RD containing the basic review forms templates and different subsections of the kind PA-DB/Section_RD/ HTR-N_yy-mm_X-W.T.N-P, assuming that subsequent document revisions could be processed in the same sub-section: the date digits, yy-mm, should be those of when the RD is submitted but, for avoiding possible incoherence with the FD date, they could be just skipped (in any case the controlling date digits, for a given document revision, are those of the FD).

Progress reports and meeting minutes files could be archived in area sections like PA-DB/Section_PR and PA-DB/Section_MM, eventually organised in different subsections, as needed.

The different HTR-N Q.A. forms and templates (such as HTR-N 01 and HTR-N 02) should also be inserted in a suitable area section of the PA-DB, or sub-section of the PA-DB/Section_FD section, where the currently applicable revisions would be maintained and updated from time to time.

Each file document inserted in the SINTER DB could be embedded with a sort of meta-information which could be automatically updated by an electronic procedure in the SINTER system. This meta-data file should in principle contain some basic information on the document : the file format, (EDP application and release), the Project identification (many are under SINTER, HTR-N in this case), the type of document (D/S) with WP-Task-Deliverable (one field per item, or just combined as “D-3.5.1”), the document identification (i.e. the HTR-N Project number), the author(s), the D/I Partner Organisation, information on the WPM and PM (Organisations and names), the Q.A. level, the current status of the document, the document chronological history (when has been inserted in SINTER the first time with its original status, when passed from RD to FD, the successive revisions).
Some of these information could be automatically extracted from the file name: when based on a coding like HTR-N-yy/mm-X-W.T.N-P_R, the Project, WP, Task, Deliverable, the progressive document number and its revision can be directly inferred. In order to extend the potential for such a description, some other codes could be eventually added to the file name, like “*_status”*, for instance.
Whereas it could be advisable to maintain limited coding to avoid potential increase of mistyping errors, it has also to be considered that the document is actually located different SINTER DB area section according to its status, which identify it univocally. Rather, such an added coding may be useful for displaying purposes, for identifying the document status at a glance.

When inserting a new document in a given SINTER DB area section, a suitable electronic procedure could be embedded in the system such to automatically inform, by a standardised E-mailing format, the interested Partners and other eligible Organisation (according to the level of dissemination attributed to the SINTER area section where the action is performed) that a new document is available in the given SINTER area-section.
The message would contain a short description of the document based on automatic extraction from the meta-file enlisting only a number of the characteristics necessary and interesting for Partners’ information purposes.
This procedure should be accessible as an option-enabled in order to avoid unwanted, useless or repeated messaging to Partners/Others.

EUROPEAN COMMISSION
5th EURATOM FRAMEWORK PROGRAMME 1998-2002
KEY ACTION : NUCLEAR FISSION

HTR-N

HTR-N & N1
High-Temperature Reactor Physics and Fuel Cycle Studies
(EC-funded Projects: FIKI-CT-2000-00020 & FIKI-CT-2001-00169)

Work Package: 3	HTR-N project document No.: <HTR-N project document no.>				Q.A. level: 1 / 2
Task: 3. .	Document type: <project doc.(see list) or deliverable>				Document status: draft/review/final
Issued by: <Partner acronym>	original document No.: <Partner document no.>	pages <no.>	Rev. <no.>	Q.A. level **A / B**	Dissemination level: **CO / RE / PU**

Document Title

Author(s)

Organisation, Country

Notes

Electronic filing: SINTER

Electronic file format: Microsoft Word 97

0	dd mm year	first issue	<Partner Acronym/Name>	<Partner/s Acronym>	NRG	FZJ
Rev.	**Date**	**Short Description**	**Prepared by**	**Partners' comments / amendments**	**Review WP Manager**	**Approval Project Manager**

confidential information property of the HTR-N project - not to be used for any purpose other than that for which is supplied

HTR-N 01/1 **Page** 1 **of** 2 + <no.> p.Annex

Figure 1 – HTR-N Project Q.A. form HTR-N 01 (first - cover/front - page)

HTR-N

Work Package: <3>	HTR-N project document No.: <HTR-N project document no.>	Rev. <no.>
Task: <3.x.x>	Document type: <EC deliverable or support type>	

Chronology and history of revisions

Rev.	Date	Description

HTR-N 02/1 Page 2 of 2 + <no.> p.Annex

Figure 2 – HTR-N Project Q.A. form HTR-N 02 (second – revisions track/following - page)

4. ACRONYMS AND DEFINITIONS

DB	Data Base
RTD	Research and Technological Development
NL	Nuclear data Library
EDP	Electronic Data Processing
CO	Confidential document
RE	Restricted document
PU	Public document
WD	Working Draft
RD	Review Document
FD	Final issue Document
WP	Work Package
PMM	Project Management Meeting
WPM	Work Package Manager
PM	Project Manager
D/I	Drafting/Issuing

7. REFERENCES

[1] "High-Temperature Reactor Physics and Fuel Cycle Studies", Annex I to Contract FIKI-CT-2000-00020, Rev.6, 20/06/2000, FZJ-TTB No.E0125.01.99.

[2] ISO 9001 International Standard "Quality systems – Model for quality assurance in design, development, production, installation and servicing".

[3] "Additional Q.A. Guidelines for the HTR-N Project", Ansaldo Nucleare, STU-HTRN – 0001 00, Rev.0, December 2000.

[4] "HTR-N Project Q.A. - Requirements for Codes and Data - Practical Experience and Procedures", Ansaldo Nucleare, HTR-N 4th PMM meeting minutes-handouts (filed @ SINTER Network, http://www-is.ike.uni-stuttgart.de/sinter/secure/mainmenu.html → SERVICES→ Data Report → Report on Meetings → Meeting with the name: → HTR-N&N1: 4th Project Management Meeting → <meeting handouts by Ansaldo>), Rev.0, November 2001.

[5] J.C.Kuijper, e-mail to the HTR-N Partners on "HTR-N/N1 5th PMM presentation handouts – Q.A. and document template", NRG, of 13 June 2002.

[6] "SINTER Network - The Sustainable & Innovative Nuclear Technology Evolution - R&D Network", http://www-is.ike.uni-stuttgart.de/sinter/.

[7] J.C.Kuijper and J.B.M. de Haas, "Definition of Common Output Parameters", HTR-N-01/02-D-3.1.5, Rev.1, NRG, 20 June 2002.