



Short Record

NUMO ITAC 2, April 10-12, 2002

1 INTRODUCTION

This short record provides a brief summary of the key points arising from review of supplied literature, discussions following NUMO presentations and subsequent ITAC discussions in a closed session. It is structured to follow the final comments and recommendations presented by Charles McCombie and thus includes 3 blocks – general comments, specific issues arising during ITAC 2 and then other issues related to future ITAC meetings.

2 GENERAL COMMENTS

2.1 Preparations

A very large amount of material was provided and ITAC was impressed by the effort which must have been required. It would be useful for ITAC to know if NUMO has to do this specially for these meetings alone or if it is intended to use this material also for other purposes. If the latter, ITAC can also provide comments aimed at polishing the text in addition to those on the technical content. Difficulties in production of such a large volume of English language material are appreciated, but clearer structuring and organisation of individual documents would put them in context and allow their review to be carried out more efficiently.

2.2 Process

ITAC appreciates considerable work carried out to prepare for this meeting and notes an improvement in the quality of presentations since ITAC 1. The extensive participation of NUMO staff was appreciated, as was the excellent working and non-working atmosphere. It was noted, however, that the boundary conditions set for ITAC did not have enough time allocated to preparation for the huge amount of information provided and also not enough time for documentation and the debriefing of ITAC by NUMO in the final session. This is referred to again for some of the specific ITAC topics noted below.

2.3 Documentation of ITAC meetings

The impression ITAC has is that the bullet form for presentation of key comments and recommendations in the final session is useful/adequate for NUMO. It is also assumed that this slightly expanded version of the latter is sufficient as a record of the meeting. NUMO should provide feedback to the secretariat if this is not the case.

ITAC considered putting text based on this record on the internet to be a good idea, but it needs very careful editing or drastic shortening of the present text. NUMO then needs to decide if it is worth also polishing the ITAC-1 report for the internet.

2.4 Overall remarks on NUMO's programme: content and status

ITAC could work more efficiently if they could see and understand a more detailed programme of NUMO activities that lie within the "frameworks" presented, including work schedules. General comments are:

- A lot of progress is being made
- Project teams are building and functioning well
- Organisational structures seem to be fine
- NUMO should think about preparing internal position papers as recommended by ITAC 1
- FAQ lists are useful and may be worth comparing with those produced by other Japanese and foreign organisations. They can also be used on the NUMO home page
- NUMO QA system was needed yesterday!! This is an extremely important topic which should be considered with high priority
- In the question of terminology for PR activities, "outreach" seems a reasonable word, reflecting well what NUMO is doing (or planning to do)
- It should be remembered that R&D may also be needed in non-technical areas: e.g. social science questions may need addressing

Some further comments which apply more generally to the Japanese nuclear waste management programme and hence may not be directly under NUMO's control are:

- It seems that NUMO still has too little contact to government, regulators and other R&D organisations – is there any way within Japanese political boundary conditions that this can be improved?
- ITAC was concerned about the lack of experience and international contact of regulator: could ITAC help (e.g. by organising workshops) in a way that would not compromise independence and separation of NUMO & regulator?

- There is too little co-ordination of R&D across all involved organisations, again is there any way within Japanese boundary conditions that this can be improved?

3 SPECIFIC POINTS ARISING FROM THE PROGRAMME OF THE ITAC-2 MEETING

3.1 Responses to ITAC-1 comments (Kitayama-san's talk)

NUMO has responded comprehensively, "one-to-one" to the last ITAC comments: this is much appreciated by ITAC members. However, the commonly used term "Agree" is unclear: it would be better to summarise what have NUMO done/will NUMO do. It is appreciated that some ITAC comments involve actions which are beyond NUMO's remit, but even these may need to be discussed if they involve stakeholder concerns.

3.2 Overall documentation structure and weighting

Some general points which apply to all NUMO documents are:

- A documentation management system is urgently needed (not just for ITAC or for current siting activities): documents should be numbered (with version numbers) and cross-referenced (this would be part of a NUMO QA system)
- Status and proposed distribution of documents needs to be clarified. Important information includes whether they are to be published somewhere or are only for ITAC use; if they are drafts or final versions; what is their history, future and life expectancy
- The availability of supporting documents (maps, etc): their source references and locations may also need to be specified

Particular comments which apply to the documentation for siting process are:

- The 3-level structure now seems suitable for purpose
- For the "instructions for volunteers" and "outreach programme" we assume that no input is needed from ITAC
- ITAC would like to see all drafts (May, August and October) of the Level 2 SF documents (even if in Japanese, to see how illustrative material is developed): there appears to be some urgency to have drafts under production very soon
- Some consideration is needed on comparative weight to be given to each Level 2 document and to consistency with other levels (especially Level 3): size, presentation, linkages, compatibility, integration should be considered. Note, in particular, that the SF and RC contents should be consistent: currently SF seem to be "bottom-up" and RC seems to be "top-down"!

- If necessary to meet deadlines, the level 3 SF document should be prioritised above RC: it provides technical justification for the higher level SF documents which may receive particular public scrutiny
- An external, "non-expert" review of level 1 and 2 documents would also be valuable (less expert than students!)

3.3 Level 1 documentation

In general, ITAC noted that it was good that this suggestion was being adopted and urgent to have at least a table of contents soon (see appended suggested list of contents from ITAC 1). As yet, it appears that only an incomplete Safety Philosophy exists. Some specific comments on the Basic Safety Philosophy document are:

- This is a very important document which will be read as NUMO's guiding principles or "mission statement" and thus should have a broader title. Really it is not just about safety, but also about NUMO's values and approach to the project and to the public
- ITAC agrees with NUMO's principles but think the wording can be improved: key messages to get over are (our wording can also be improved!):
 - NUMO is implementing a waste disposal system that protects people and the environment now and in the future
 - without imposing undue burdens on current and future generations
 - in an open, trustworthy, approachable and fair manner that involves people in the process and in the decisions
- The term "undue burdens" may need to be expanded on, noting emphasis is socio-economical rather than risk to health
- Specific points:
 - under 2.2 (1): emphasise that NUMO will develop a "safety culture", in which safety is **based on** selecting a good site, good design (i.e. having a sound safety concept) and which can be **demonstrated** with confidence by recognised and readily understandable assessment methods
 - under 2.3 (1) selection procedure, use "comprehensive characterisation and assessment" not "comprehensive characterisation"
 - 2.3 (1) should also include the decision process as the last item
- Emphasise that NUMO will be subject to strict regulations (and supervision by a regulator?)
- 2.3 (4): needs to emphasise that this will be a slow, staged process that will allow people to be involved in key decisions

- Document tone tends to imply "us and them": e.g. 2.3 (5) "measures to reduce public concern" could be re-titled: "additional measures taken to address public concerns", showing how the project will be staged to allow input to decisions at key points over many years. Developing a "partnership" with the public might be emphasised
- Quality Control: needs to be either brought to a higher level, or mentioned in each box on the flowchart

3.4 Comments on RC

This was a case where general issues such as readership, style, level of detail, completeness, etc. could not be discussed in detail due to lack of time. Effort was concentrated instead on providing a page-by-page review of the RC document. The key comments and recommendations are (for clarity, text changes also on a hard copy provided to Umeki-san):

- Page 1: paragraph 2 should come first: change paragraph 1 text to "a decision on whether an investigation programme can be accepted or not": "...stakeholders and residents..." to "...stakeholders, especially residents..."
- Page 2: take out fuel cycle diagram (put in reactor?) and explain where HLW comes from: make radiation decline figure 1D (or 2D, at most)
- Page 3: P&T should emphasise destruction (take out P): remove space "at present": say '**managed** long term storage"
- Page 4: Title 'How does geological disposal ensure safety?': second cartoon is too complex - chemistry and flow should be removed: make page much less technical and PA-oriented
- Page 5: title something like "What does a deep repository look like?": remove bottom box on safety in any case, but maybe better with figure from p57 with scale illustrated
- Page 6-7: OK
- Page 8 to 11: reduce numbers of environments and show only a few examples or – even better – a single 3-D block diagram that shows all environments at once, including areas that would be excluded
- Page 12-15: better not to use term "reference design"; add scale bars; show a wider range of realistic designs considered by NUMO (if necessary, refer to international pictures and examples)
- Page 16 – 19: numbers wrong on caption on p 16: very nice illustrations!
- Pages 20 – 21: also good pictures; title should include "layout"; remove "reference design"

- Pages 22 – 23: p22 remove boxes – just note examples of potential design without highlighting a single reference design (NB, in usual terminology, the backfill and liner would be considered part of the EBS)
- Pages 24 – 27: put in site characterisation picture (e.g. equipment hut and drilling rig); put in underground test facility stage; combine construction and operation stages; show monument in final picture; show annual employment profiles
- Pages 28 – 29: insert extra page(s) on site characterisation activities (above / below ground) with pictures of the activities involved
- Pages 30 – 31: too many small pictures (maybe enough to show for either hard or soft rock)
- Pages 32 – 33: emphasise extensive safety experience of transport
- Pages 33-34: OK
- Pages 36 – 37: remove
- Pages 38 – 39: transportation and emplacement processes – with emphasis on the latter - on a greatly simplified illustration
- Pages 40 – 41: show picture of real plug (e.g. Äspö); give scales
- Pages 42- 43; make separate block on pre-closure environmental impacts: very important block – must be expanded, make more comprehensive (e.g. radiation monitoring, noise, traffic), show nice pictures of people doing things; note that no releases at all during operation; show use of spoil (link this page to any Japanese requirements for an EIA); add an extra page on social impacts (employment, economic, traffic, accommodation, flux of people)
- Pages 44 – 45 and 46 - 47: should become a specifically monitoring page: combine construction and operation stages, add post-closure
- Pages 48 – 49 and 50 – 51 : remove
- Pages 52 – 53: make clear reversibility considered on non-technical grounds (a possible question here is what the "performance confirmation period" is!)
- Page54 onwards: reduce and make very much simpler: show safety concept : needs something on continued R&D, analogues and natural comparisons: remove PA emphasis.

3.5 Further RC presentations (Ohnishi-san; Umeki-san; Ueda-san)

Unfortunately these could not be discussed in the closed session due to lack of time. Reference is made, however, to the review comments provided in advance by ITAC. Some further points from the discussion of the presentations are summarised below.

Ohnishi-san gave a clear overview of the main discussion points from the DTAC sub-committee on engineering technology and performance assessment. Although there were many similarities to points identified by ITAC, some differences were also apparent. Discussing these differences was considered to be a useful topic for a joint ITAC / DTAC meeting (see 4.2: "DTA / ITAC issues" below).

Umeki-san's presentation of the "Framework" for design and performance assessment studies caused extensive discussion. Particular concerns were associated with the definition of boundary (or initial) conditions and the feedbacks / relationships between siting factors, design concept and expected behaviour. The figure used to illustrate the latter did not seem to be capable of clearly presenting all the feedbacks involved.

The basic principles of developing this framework was recognised to be valuable. International experience indicated, however, that it would be extremely difficult to bring together all the factors influencing design as seen from the viewpoint of an Implementer (long-term and operational safety, practicality / QM, cost, etc.) in a single diagram or even a short document. This topic would be worth further discussion in a future ITAC or in a smaller working group.

Ueda-san's presentation gave a good overview of ongoing work but the detailed information presented could not be reviewed in detail. Again, this could be a topic for a future ITAC or a small working group.

3.6 SF comments

Some general comments based on the introductory presentation by Tsuchi-san are:

- The introductory presentation was clear and well structured and the summary of past and future R&D programme was valuable
- Definitions of categories: give the categories clear explanatory names (e.g. as suggested at ITAC 1), which show that Category 1 (a and b) are both used to decide whether to **exclude** sites; Category 2 is used to evaluate and compare non-excluded sites
- The only clear criterion in Category 1a is for volcanism: active faults also need a clear quantitative criterion (e.g. x km respect distance) otherwise it cannot be applied sensibly (problem of blue and white 10 km boxes on the "exclusion map"): should explain derivation of quantitative values somewhere (level 3 documentation)
- Completeness: Category 2 technical criteria do not appear complete (even at this stage of siting: e.g. operational phase) and could usefully be compared with international lists – maybe emphasise that Category 2 cannot be complete at this stage as it depends on the repository concept and on local features, so it will be a living list

- The matrix displays of factors and impacts (Category 2) needs to be rationalised (columns are mixed up at present)
- The ITM approach seems to be a good way of addressing SF and could be applied to other (non tectonic) factors; ITM conclusions have not been fully used in current definitions of SFs

Some comments on the current activities listed in Tsuchi-san's introduction:

- Addressed ITAC 1 comments clearly!
- Should consider "exploitable" rather than just currently worked resources
- The responsibility for using data of correct quality is with NUMO, not originators
- When considering seismic hazard, distinguish between underground and surface nuclear facilities
- For an international cross-check of SFs: ITAC offered to provide information on AK-END, Sweden and WIPP
- It would be much less controversial if groundwater, as a present or future resource, is treated as a weak Category 2 criterion
- Clarify whether an exclusion map should be included or not: ITAC thinks NUMO should try to produce one, for transparency reasons, and it should be in a Level 2 document. If the current map is well described it could be used, but remember it is very committing in that this is a clear statement of how NUMO's siting policy is actually implemented. It would be very difficult to remove any area which was excluded in this map at a later stage. A decision to publish the map is irreversible and so NUMO need to be very sure that, for example, no area within the volcanic exclusion zone would be investigated as a potential site under any circumstances
- It is also extremely important to ensure that the map is completely accurate as it would certainly be examined closely by many stakeholder groups (including nuclear opponents). If it contained any significant errors (as a worst case, imagine if Mt Fuji was missing), this could really destroy NUMO's technical credibility. Quality control must thus be absolutely rigorous!
- In summary, such an unambiguous policy statement by NUMO is recommended by ITAC, as long as the points noted above are recognised and accepted.

Individual SFs were commented on, based on presentations or subsequent questions about SFs which were not included in the programme of the meeting.

Volcanism:

- Justification for 15 km radius exclusion zones presented in overheads should be very clearly documented

- Sensitivity of 15km could usefully be explored (i.e. would 20 km affect the excluded area much as there is a lot of overlap?)
- ITAC strongly supports the idea of publishing this approach in the technical literature to extend ideas to a broader community
- The extended buffer zone concept and validity of "A₁" areas approach both should be explored further by ITM
- It should be emphasised that these issues are influenced by the explorability of PIAs.

Uplift:

- It will eventually be necessary to consider uplift as a potential exclusion criterion, but this cannot be done reliably at a national scale, (i.e. as Category 1 a) at present
- As a Category 1 b criterion, a suggestion is to base it on a repository originally located at maximum depth (1000 m ??) not reaching a depth of <300m in 100 ka (i.e. 7 mm / a)

Earthquakes:

- The separation of seismic aspects into shaking and faulting is sensible, but reasons for doing this could be made clearer
- Documentation is needed to substantiate conclusions about the insignificance of shaking to repository safety, both pre- and post-closure (it is certainly not obvious to the general public)
- The susceptibility of both deep and surface facilities to seismic shaking could be used to discriminate between PIAs and it should thus be considered as a Category 2 criterion
- Apart from the deep repository structures, the site should be suitable to host surface facilities designed to withstand maximum estimated earthquakes: a useful analogue facility could be an interim storage facility for nuclear waste (rather than a power plant)

Active faults:

- The justification for earthquake effects on active faults being considered insignificant should be given (as this appears of concern in other countries)
- There is an urgent need to develop quantitative avoidance criteria for Category 1 (a)
- Faults should also appear as Category 2 criteria as they will affect repository layout (and will need to be considered together with any "inactive" faults)

Resources & Unconsolidated Deposits :

- Should emphasise that focus on unconsolidated deposits is on constructability and that it would eliminate areas of thick Quaternary sediments as a Category 1 b criterion
- Natural resource specifications should be tightened with respect to exclusion: "potentially exploitable" rather than "currently exploited" would be the ideal formulation (although it is recognised that the legal specification has to be respected)

Category 2 technical criteria:

These need considerable reworking but ITAC had insufficient time to discuss these SFs further. A possible topic for a smaller working group.

Category 2 non-technical / socio-economic:

- ITAC appreciate that this is at an early stage , but approach is sensible and ITAC can provide international lists to help
- access to and ownership of land are both important and the former may be critical for the site characterisation programme

4 OTHER ISSUES**4.1 Workshops / review papers**

General discussions have indicated a number of technical areas where NUMO has to make very important decisions within the next few years. In these, it may be valuable to establish consensus, or determine the state of the art, internationally. ITAC suggest that focused workshops (based on ITM model), working groups or review teams could help bring together Japanese and foreign experts. Some topics could be:

- Safety assessment programme
- MAA
- QA
- Alternative repository concepts
- ITM on fault avoidance strategies
- Influence of introduced concrete
- Treatment of the EDZ

This list could be expanded with ITAC input and reviewed together with NUMO to establish priorities and determine how ITAC could help ensure that optimum use is made of international expertise.

4.2 DTAC/ITAC issues

There was little time to discuss these fully, but a particular point to be examined are the agreements/differences in the output from these 2 groups (e.g. groundwater as a resource). Joint session topics need to be listed, but initial suggestions are:

- Language interpretation (problems of meaning of key terms in Japanese and English)
- Level 1 documentation: exchange of views

4.3 Input for ITAC 3 and 4

This still needs sorting out, but at least the dates are now fixed:

- ITAC 3: 16 to 19 July with DTAC joint meeting on 17th
- ITAC 4: 26 to 28th November

Appendix 1:

Suggested contents for a Level 1 document (from 1st ITAC)

This document could clearly present NUMO's main messages to all key stakeholders.
Such messages could include:

- A solution is needed for Japan's HLW
- Geological disposal can be carried out safely in Japan
- Geological disposal has been chosen not only for Japan but also many other countries
- NUMO has been set up with the competence to site and build such a geological repository
- At least one site must be found: NUMO has already informed all communities in Japan
- NUMO has developed traceable criteria and procedures for a staged siting process
- These exclude some areas in Japan
- In the remainder NUMO will seek volunteer communities to become involved in the siting process
- NUMO will ensure safety by transparent evaluation of potential sites
- What will happen if you agree to co-operate with NUMO is ...
 - You become a **partner** in the process, providing input and being involved in decisions at all stages (...if this is the case?)
 - You will have complete freedom to withdraw at any stage until final decision is taken(...if this is the case?)
 - The stages are (... fill in details)
 - The first stage is....and it would commit you to.....(... fill in details)
 - Receive financial **and other** benefits, and assistance to allow you to participate fully