DRAFT

NKS(13)3
2013-05-06

Agenda for the board meeting in Copenhagen 28 May 2013

Place: Hotel Hilton, Ellehammersvej 20, DK-2770 Kastrup
Location: Bragi
Time: 10:00 to 15:00

1 Opening

2 Practical remarks

- Meeting secretary.
- Information from chairman and host.

3 Approval of the agenda

4 Minutes of the last board meeting (Stockholm, 2013-01-08)

- See draft minutes NKS(13)1 dated 2013-02-06.
- Review, discussion and decision.

5 Accounts 2012

- See distributed material: Financial Statements 2012, NKS(13)2 and Long-Form Audit Report, both dated 2013-04-09.
- Presentation by the auditor and the secretariat, discussion and decision.

6 Financial status for the current year

- See distributed material: Financial status report and financial programme specification, both dated 2013-05-13.
- Presentation, discussion.

7 News since last board meeting

- Report from the owners group.
- News from the board members' organisations.
- Administrative news.

8 R-part: status

- See material from Kaisu Leino: status report May 2013.
- Presentation by the programme manager.
- Discussion.

9 B-part: status

- See material from Kasper Andersson: status report May 2013.
- Presentation by the programme manager.
- Discussion.

10 Fukushima seminar

- Presentation by the coordination group with conclusions of the seminar survey.
- Discussion.

11 Information activities

- The website, NewsLetters, NewsFlashes etc.
- Presentation by Finn Physant.
- Considerations about how to inform about NKS work by the programme managers
- Discussion.

12 NKS and social media - SOME

- Presentation by Kaisu Leino
- Discussion.

13 Research activities in 2014

- Call for Proposals.
- Preliminary budget 2014.
- Funding 2014.
- Discussion, decision.

14 Other issues

- Translation of Bo Lindell's books.

15 Next meeting

- Next meeting will be in January 2014 possibly in Reykjavik.

16 End of meeting

DRAFT
NKS(13)1
2013-02-06

Minutes of the board meeting in Stockholm 8 January 2013

Present: Sigurður M. Magnússon (chairman), Jorma Aurela, Ole Harbitz, Steen Hoe, Tarja Ikäheimonen, Finn Ugletveit, Nici Bergroth, Atle Valseth, Kaare Ulbak, Jens-Peter Lynov, Timo Vanttola, Eva Simic, Annelie Bergman, Olga German, Kaisu Leino, Kasper Andersson and Finn Physant (meeting secretary). Jack Valentin was present during the handling of meeting item 12.
Apologies: Lars Gunsell

1 Opening

The chair opened the meeting, welcomed all participants, and expressed many thanks to the host Strålsäkerhetsmyndigheten (SSM). A special welcome was given to the three new Swedish members of board Annelie Bergman, SSM, Eva Simic, SSM and Olga German, Vattenfall. This was to be Lars Gunsell's, SSM last board meeting, but he was not able to participate, and the chair thanked him for good cooperation and many constructive and important contributions to NKS over the years.

2 Practical remarks

Practical remarks about the meeting were given by the chair. Finn Physant was appointed meeting secretary.

3 Approval of the agenda

The agenda was approved.

4 Minutes of last board meeting (Copenhagen, 29 May 2012)

The minutes were approved.

5 News since last board meeting

a) Report from owners group meeting
There has been no owners group meeting since the last board meeting.
b) News from board members organisations
The members informed each other about relevant news.
c) Administrative news
No comments had been received from board members concerning the updated "NKS Administrative Handbook" or the new "Handbook for NKS applicants and activity leaders" that were presented at the May 2012 board meeting.

In the minutes from the May 2012 board meeting it was noted that it was important to stress the specific goal for NKS to contribute to a common Nordic view on nuclear and radiation safety in a new pamphlet about NKS and other NKS promotional material.
The PC-B presented the new pamphlet "Nordic Nuclear Safety Research" that states this goal clearly. The PC-B also showed an excerpt from a revised version of the section 'This is NKS' on the website. The board agreed that the handbooks, website and pamphlet now contain the important information that was in the policy document, and that the policy document (NKS(08)2 rev 5) is no longer needed. It was also agreed to make the content of the pamphlet available on the NKS website, in a suitably formatted version.

6 Financial status

Finn Physant presented the distributed material: Financial status report and financial programme specification, both dated 10 December 2012. The reserve just before the end of the fiscal year 2012 end of this month (January 2013) was estimated to approximately 1.85 MDKK and expectedly ca. 0.5 MDKK can be added to the reserve at the start of the fiscal year 2013 February 1, 2013. – The board took note of the positive financial situation.
It was agreed that an overview of the trends and status of all on-going/unfinished activities shall be presented to the board at the board's next meeting.

7 Agreements

The following agreements were prepared for the board's decision:
-R-part programme manager 2013 with Fortum
-B-part programme manager 2013 with DTU Nutech
-secretariat until 30 June 2014 with FRIT and
-auditing for the accounts of 2012 with Dansk Revision.
All the agreements were approved.

8 R-part: status and new activities

Kaisu Leino presented the status of the ongoing activities. All projects are running according to plan. All activities started in 2011 have been finalized and reported. Activities commenced in 2012 are on schedule, and only minor delays are expected if any.
Kaisu Leino presented the evaluation results and funding recommendation for CfP 2013 – a total of 10 proposals were received. The board agreed to fund the following activities in 2013 (all amounts in kDKK):

ENPOOL	600
DECOSE	500
HUMAX	500
SADE	500
DPSA	400
L3PSA*	390
POOLFIRE*	360
DIGREL	300
Decom-sem*	200
Exam HRA	200

The projects marked with an asterisk had been flagged in the proposals as "cross-over" R/B activities. The board's view was that these were mainly R projects with a limited B content

and the activities would run as R activities due to the overall dominant focus on NKS-R issues in the proposals. The total budget for these 10 activities is 3950 kDKK.
The PC's will revise the proposal template so that applicants will need to indicate if they deem that their proposal should be considered as 'cross-over', and then briefly describe the main 'cross-over' features. The PC's will following examination of the proposal decide if the proposal is to be evaluated as a 'cross-over' proposal.

9 B-part: status and new activities

The PC-B presented a status report for ongoing activities. All activities started before 2012 are finalised. The PONPP2 activity has still not started and the contract remains unsigned because the authorities (NRPA, SSM and STUK) have not been able neither in 2011 or 2012 to allocate required resources to the project due to other prioritized activities. – The board decided that the board members from NRPA, SSM and STUK shall see if required resources can be allocated in 2013, for both interviews and the planned workshop. If it is not possible to allocate resources the PONPP2 will be cancelled. The PONPP2 project leader should be informed by NRPA, SSM and STUK about their decision as soon as possible.
All activities that started in 2012 are on schedule, with the exception of the THYROID activity, for which essential calibration sources were received with considerable and unforeseen delay from Russia. As a result a revised schedule was presented, and the final report of the activity is expected by the 30th of October 2013. The NKS board agreed to finance the following activities in 2013:

EMSEM	210 kDKK
MUD	360 kDKK
COSEMA	500 kDKK
RADIOANALYSIS	370 kDKK
BERMUDA	380 kDKK
GAMMATEST	370 kDKK
NOVE	225 kDKK

The total budget for these 7 activities will be 2415 kDKK.
A decision was made that future contracts for NKS activities need to be signed within 12 months of the board's approval for funding to be provided. The PC's will consider how NKS can better inform about the NKS work and promote the CfP and report back to the board at the board's next meeting.

10 Budget for 2013

Finn Physant presented the distributed budget proposal of 2 January 2013 from the coordination group. – All contributions were noted to and confirmed by the owners' and co-financiers' representatives. The budget approved by the board is attached in appendix A.
Olga German noted – as the representative of the Swedish co-financiers' – that the Swedish co-financiers' would be interested in an agreement with NKS about the development of the yearly amount of their contributions for some years ahead. The chair and the secretariat will address this issue and make a proposal to the board at its next meeting.

11 Information activities

Finn Physant informed the board about the status of the new website, which was opened in May 2012, NewsLetters etc. The new website has so far proven very flexible and user

friendly – it has also by far met the needs and wishes of the cordination group. The statistics of the old website were discontinued, but new statistics will be presented at the next board meeting. Six NewsFlashes and one NewsLetter have been distributed since the last board meeting – especially including news on the Fukushima seminar. There is now a list of more than 400 e-mail adresses, to which the electronic letters are sent. A new and updated version of the pamphlet ”Nordic Nuclear Safety Research” has been published. A book of abstracts, new rollups and other seminar material have also been produced in connection with the Fukushima seminar.

Kaisu Leino presented possibilities for NKS to be on social media. The board decided to support the idea of using Facebook and LinkedIn to promote NKS. The ideas for use of social media to promote NKS will be further developed by the PC’s and reported to the board at its next meeting.

As an information activity Nici Bergroth asked for a survey to be carried out after the Fukushima seminar. It would be important and valuable to get feed-back from the seminar participants. It was decided that such an evaluation shall be carried out by the coordination group. The group will present the result of the evaluation at the board’s next meeting.

12 Translation project

The chair presented Jack Valentin, who participated in the board meeting as a representative of NSFS and the chairman of the Lindell book translation project. Jack Valentin presented the project to the board. Based on a translator’s quote the translation time for all four books is estimated to 1½ years. The total budget will be 120 kEUR inclusive of VAT.

The board decided that there was now sufficient information to grant 40 kEUR for the translation project. – 20 kEUR shall be included in the 2013 budget (appendix A) and paid at the start-up of the project. 20 kEUR more shall be reserved for the 2014 budget and paid when the two first books have been translated.

The result of the project will be files of the books for cost-free downloading from NKS’ website if NKS agrees to host the files. Hard-copy versions will be provided at cost price through print-on-demand. The chair will inform the board about the development of the translation project.

13 Other issues

No other issues.

14 Next meeting

Next meeting will be in Copenhagen 28 May 2013.

15 End of meeting

Many thanks for a good meeting – especially to the host SSM – were expressed by the chairman.

Sigurður M. Magnússon
Chairman

Finn Physant
Meeting secretary

Appendices:
A: Budget decision for 2013
B: Actions from the board meeting

Appendix A

Budget decision for 2013 - 8 January 2013

Budgets	**Budget for 2013**	**Budget for 2013**	**Budget for 2012**
	EURO	**DKK**	**DKK**
R-part			
Activities	529.462	3.950.000	3.700.000
Fee PC	62.999	470.000	450.000
Travels PC	13.404	100.000	100.000
Coordination	13.404	100.000	100.000
Young scientists' travel	13.404	100.000	100.000
R total	**632.674**	**4.720.000**	**4.450.000**
B-part			
Activities	323.709	2.415.000	3.320.000
Fee PC	62.999	470.000	450.000
Travels PC	13.404	100.000	100.000
Coordination	13.404	100.000	100.000
Young scientists' travel	13.404	100.000	100.000
B total	**426.921**	**3.185.000**	**4.070.000**
Translation project			
Translation project	20.000	149.208	0
Translation total	**20.000**	**149.208**	**0**
Common			
Common various according to specification	33.510	250.000	250.000
Fukushima	0	0	100.000
Common total	**33.510**	**250.000**	**350.000**
Others			
Fee Secretariat	82.435	615.000	590.000
Fee Chairman incl. travels	58.978	440.000	420.000
Travels Secretariat	1.340	10.000	10.000
Others total	**142.754**	**1.065.000**	**1.020.000**
TOTAL	**1.255.859**	**9.369.208**	**9.890.000**
Expected incomes according to app. 1	**1.237.275**	**9.230.565**	**8.856.400**
Surplus	**-18.584**	**-138.643**	**-1.033.600**

Any deficits to be covered by the reserve available for the board, which according to the financial status report of 10 December 2012 is: ca. 1.850.000 DKK.
Funding reserved for use in 2012, but not used, will amount to ca. 500.000 DKK.

Total reserve January 2013 - ca. 2.350.000 DKK or ca. 315.000 €.

Specification of "Common" for 2013

	2013	**2013**	**2012**
	EURO	**DKK**	**DKK**
Common			
Reports, materials etc.	4.021	30.000	30.000
Postage, fees	1.005	7.500	10.000
Equipment	2.011	15.000	15.000
Internet	12.064	90.000	90.000
Auditing, consulting	7.707	57.500	55.000
Information material	4.021	30.000	30.000
Various expenses	2.681	20.000	20.000
Common total	**33.510**	**250.000**	**250.000**

Appendix 1 for budget decision for 2013

Pledge for funding in 2013 - Incomes

	Proposal for 2013	Proposal for 2013	Actual for 2012
	EURO	**DKK**	**DKK**
SSM	531.455	3.964.870	3.795.610
TEM	340.000	2.536.536	2.453.286
BRS	57.400	428.227	410.368
GR	24.000	179.050	178.421
NRPA	170.349	1.270.875	1.198.500
Total EURO / DKK	**1.123.205**	**8.379.558**	**8.036.185**

SSM contribution SEK	4.550.000
NRPA contribution NOK	1.250.000

	EURO	**DKK**	**DKK**
Fortum	23.500	175.319	167.270
TVO	23.500	175.319	167.270
Fennovoima	7.000	52.223	52.039
IFE	11.500	85.795	81.776
KSU	12.180	90.868	87.909
Forsmark	12.770	95.269	92.184
Ringhals	12.000	89.525	87.909
OKG	11.620	86.690	83.858
Total EURO / DKK	**114.070**	**851.008**	**820.215**
Complete EURO / DKK	**1.237.275**	**9.230.565**	**8.856.400**

Exchange rates 2012/13:

NKS 2013:	
DKK	100,0000
EURO	7,4604
NOK	1,0167
SEK	0,8714
NKS 2012:	
SEK	0,8342
EUR	7,4342
NOK	0,9588

Appendix B

Actions from the board meeting
(if nothing else is mentioned to be taken by the coordination group):

A. Ref. item 5: new pamphlet in suitable format to be uploaded on the website.
B. Ref. item 6: overview of the trends and status of all on-going/unfinished activities shall be presented to the board at its next meeting.
C. Ref. item 8: The PC's will revise the proposal template so that applicants will need to indicate if they deem that their proposal should be considered as 'cross-over', and then briefly describe the main 'cross-over' features. The PC's will following examination of the proposal decide if the proposal is to be evaluated as a 'cross-over' proposal.
D. Ref. item 9: The PONPP2 project leader should be informed by NRPA, SSM and STUK about their decision on resource allocation to PONPP2 as soon as possible.
E. Ref. item 9: the PC's will consider how NKS can better inform about the NKS work and promote the CfP and report back to the board at the board's next meeting.
F. Ref. item 10: concerning a future support agreement with the Swedish co-financiers. The chair and the secretariat will address this issue and make a proposal to the board at its next meeting.
G. Ref. item 11: the ideas for use of social media to promote NKS will be further developed by the PC's and reported to the board at its next meeting.
H. Ref. item 11: a survey to be carried out after the Fukushima seminar. The coordination group will present the result of the evaluation at the board's next meeting.
I. Ref. item 12: the chair will inform the board about the development of the translation project.

The Secretariat

2013-04-09
NKS(13)2

Financial statements

for

The Nordic Nuclear Safety Research Programme
NKS Secretariat

2012

9 April 2013
Finn Physant
FRIT

Statement by Management

The NKS Secretariat and Group of Owners have discussed and approved the annual report of The Nordic Nuclear Safety Research Programme (in the following referred to as 'NKS') for the financial year 1 January 2012 - 31 December 2012.

In our opinion, the financial statements provide a true and accurate picture of the organisation's assets, liabilities and equity, financial position as at 31 December 2012 and the results of the organisation's activities for the financial year 1 January 2012 - 31 December 2012.

In our opinion, the management's review includes a fair review of the matters dealt with in the management review.

We recommend the financial statement for approval by the Group of Owners.

Roskilde, 9 April, 2013

NKS Secretariat:

Finn Physant

Copenhagen, 28 May 2013

Group of Owners:

Sigurður M. Magnússon
Chairman

Steen Cordt Hoe

Jorma Aurela

Ole Harbitz

Eva Simic

Independent Auditors' Report

To the group of owners of NKS

Report on the Financial Statements

We have audited the financial statements of NKS for the financial year 1 January to 31 December 2012, which comprise income statement, balance sheet and notes, including Financial Programme Specifikation. The financial statements are prepared in accordance with the agreements and generally accepted practices.

Management's responsibility for the financial statements

The Management is responsible for the preparation of financial statements that give a true and fair view in accordance with the agreements and generally accepted practices and for such internal control as the Management determines is necessary to enable the preparation of financial statements that are free from material misstatement, whether due to fraud or error, and selecting and applying an adequate accounting policies and the making of accounting estimates which are reasonable under the circumstances.

In addition, Management is responsible for the transactions covered by the financial statements are consistant with the contribution, laws and other regulations, agreements and generally accepted practices.

Auditor's responsibility and basis of opinion

Our responsibility is to express an opinion on the financial statements based on our audit. We conducted our audit in accordance with International Standards on Auditing and additional requirements under Danish Audit regulation as well as the public accepted auditing standards. This requires that we comply with ethical requirements and plan and perform the audit to obtain reasonable assurance about whether the financial statements are free from material misstatement.

An audit involves performing procedures to obtain audit evidence about the amounts and disclosures in the financial statements. The procedures selected depend on the auditor's judgment, including the assessment of the risks of material misstatements of the financial statements, whether due to fraud or error. In making those risk assessments, the auditor considers internal control relevant to NKS's preparation of financial statements that give a true and fair view. In order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of NKS's internal control. An audit also includes evaluating the appropriateness of accounting policies used and the reasonableness of accounting estimates made by the Management, as well as the overall presentation of the financial statements.

The audit also involves an evaluation whether there are established procedures and internal controller that are supportive, for the transactions covered by the financial statements are consistant with the contribution, laws and other regulations, agreements and generally accepted practices.

We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our opinion.

The audit has not resulted in any qualification.

Independent Auditors' Report

Opinion

In our opinion, the financial statements give a true and fair view of NKS's financial position at 31 December 2012 and of the results of NKS's operations for the financial year 1 January to 31 December 2012 in accordance with the agreements and generally accepted practices .

It is also our opinion that there are established procedures and internal controls that supports that the transactions are subject to the financial statements are consistent with the contributions, laws and other regulations, agreements and generally accepted practices.

Statement on the management's review

Pursuant we have read the Management's review. We have not performed any further procedures in addition to the audit of the financial statements. On this basis, it is our opinion that the information provided in the Management's review is consistent with the financial statements.

Roskilde, 9 April 2013

Dansk Revision Roskilde
Godkendt revisionsaktieselskab

Palle Sundstrøm
Partner, State-Authorised Public Accountant

Management's review

2012 has been characterised by planned work/operation of the R (Reactor)-part and the B (Emergency Preparedness)-part.

A new programme manager for the R-part has been appointed.

In the course of 2012, the currency market for the Norwegian and Swedish currency has developed in a positive direction in comparison with the Danish currency and the EURO. The total foreign exchange gain at the end of the year is at DKK 231,168 / EUR 30,986.

The financial statements are presented in DKK, but the amounts are also stated in EURO in a separate column.

The financial statements show a profit of DKK 638,255 / EURO 85,552, which is consistent with decisions taken by the Board.

Subsequently, the equity as at 31 December 2012 constitutes DKK 8,778,501 / EURO 1,176,680.

In assessing the year's profit and equity as at 31 December 2012, consideration must be made of the contracts for the R and B parts of DKK 5,595,722 / EURO 750,057, where invoices have not yet been received or where the work has not yet been completed.

It may also be indicated that NKS in accordance with programme managers' statements has received external funding of around DKK 16,4 mio. / EUR 2,2 mio. in the form of un-charged contributions. The external funding is the work performed in connection with the implementation of activities for which invoices will not be sent.

Unused coordination and travel funds for programmes for the year 2011 are returned to the reserve as are unused common programme costs for a total of DKK 489,953 / EURO 65,673.

Sigurður M. Magnússon
Chairman

Income statement 2012

Income statement

				Rate
Grants and interest income				**7,4604**
Beredskabsstyrelsen DK	DKK	410,367.84	EURO	55,006.14
Arbets- och näringsministeriet FI	DKK	2,453,286.00	EURO	328,841.08
Geislavarnir ríkisins IS	DKK	178,420.80	EURO	23,915.71
Statens strålevern NO	DKK	1,198,500,00	EURO	160,648.22
Strålsäkerhetsmyndigheten SE	DKK	3,795,610.00	EURO	508,767.63
Additional funding	DKK	820,215.30	EURO	109,942.54
Distinct contribution	DKK	0.00	EURO	0.00
Interest income + other income-exch.adjustments	DKK	345,769.31	EURO	46,347.29
Total grants and interest income	**DKK**	**9,202,169.25**	**EURO**	**1,233,468.61**
Expenses				
R-Part	DKK	4,271,869.68	EURO	572,605.98
B-Part	DKK	2,930,892.53	EURO	392,859.97
Activity support	DKK	149,824.18	EURO	20,082.59
Fees	DKK	1,017,000.00	EURO	136,319.77
Common program expenses	DKK	184,796.45	EURO	24,770.31
Travels	DKK	9,531.51	EURO	1,277.61
Total expenses for the NKS programme	**DKK**	**8,563,914.35**	**EURO**	**1,147,916.24**
Income - Expenses	**DKK**	**638,254.90**	**EURO**	**85,552.37**

Balance sheet 2012

Balance sheet

Assets:				**Rate**
				7,4604
Giro and bank accounts converted to DKK, Note 1				
FI-giro 800015-70837915	DKK	1,985,742.87	EURO	266,171.10
NO-giro 7874.07.06976	DKK	2,754,828.92	EURO	369,260.22
SE-giro 6 64 63-1	DKK	3,644,034.11	EURO	488,450.23
DK/IS-giro 918-9297	DKK	1,664,770.48	EURO	223,147.62
Giro account totals	DKK	10,049,376.38	EURO	1,347,029.16
Total Assets	**DKK**	**10,049,376.38**	**EURO**	**1,347,029.16**
Liabilities:				
Equity:				
Retained from previous years	DKK	8,140,246.48	EURO	1,091,127.35
Result of this year	DKK	638,254.90	EURO	85,552.37
Total equity	**DKK**	**8,778,501.38**	**EURO**	**1,176,679.72**
Statement for new financial year, Note 2	DKK	1,270,875.00	EURO	170,349.45
Total Liabilities	**DKK**	**10,049,376.38**	**EURO**	**1,347,029.16**

Notes

					Rate
Note 1: Giro and bank accounts:					7,4604
FI-giro 800015-70837915					
Holding 31.01.2013	EURO	266,171.10			
Exchange equalisation		1,719,571.77			
Holding	DKK	1,985,742.87	EURO	266,171.10	
NO-giro 7874.07.06976					
Holding 31.01.2013	NOK	1,415,463.89			
Giro deposits 31.01.2013		1,294,115.06			
Exchange equalisation		45,249.97			
Holding	DKK	2,754,828.92	EURO	369,260.22	
SE-giro 6 64 63-1:					
Holding 31.01.2013	SEK	4,181,815.60			
Exchange equalisation		-537,781.49			
Holding	DKK	3,644,034.11	EURO	488,450.23	
DK/IS-giro 918-9297:					
Holding 31.01.2013	DKK	1,664,770.48			
Holding	DKK	1,664,770.48	EURO	223,147.62	
I alt	**DKK**	**10,049,376.38**	**EURO**	**1,347,029.16**	

Note 2: Statement for new financial year from Statens strålevern
Owner contribution 2013 – Paid 24 January 2013

Notes

Financial programme specification - 31 January 2013

	DKK							EURO	Rate 7,4604	
Total	Budget from 2011	Returned 2011	Budget 2012	Total budget 2012	Payments made	Contracts signed	Rest budget	Payments made	Contracts signed	Rest budget
R-Part	2,200,277	-235,276	4,650,000 1)	6,615,001	4,271,870	2,086,250	256,881	572,606	279,643	34,433
B-Part	3,352,767	-207,958	3,870,000	7,014,809	2,930,893	3,509,472	574,444	392,860	470,413	76,999
Activity support	179,757	10,243	100,000	290,000	149,824	0	140,176	20,083	0	18,789
Fees	1,750	-1,750	1,010,000	1,010,000	1,017,000	0	-7,000	136,320	0	-938
Common programme exp.	54,024	-54,024	250,000	250,000	184,797	0	65,203	24,770	0	8,740
Travels	1,188	-1,188	10,000	10,000	9,532	0	468	1,278	0	63
Total	5,789,763	-489,953	9,890,000	15,189,810	8,563,916	5,595,722	1,030,172	1,147,916	750,057	138,085
	F_1	F_2	F_3	F	G	H_1	H_2	G	H_1	H_2

$F_1 + F_2 + F3 = F$
$F - G = H = H_1 + H_2$

1) In the budget 2012 figure of DKK 4.650.000 for the R-Part, an amount of DKK 200.000 of the B-Part's budget is included in the budget for the RASTEP activity

Notes

Detailed financial programme specification
31 January 2013

	DKK							EURO	7,4604	
Specifikation:	Budget from 2012	Returned 2012	Budget 2013	Total budget 2013	Payments made	Contracts signed	Rest budget	Payments made	Contracts signed	Rest budget
R-Part: Common program.	371,474	-146,474	650,000	875,000	478,030	225,000	171,970	64,076	30,159	23,051
Activities	1,740,001	0	3,900,000	5,640,001	3,778,751	1,861,250	0	506,508	249,484	0
Travel young scientists	88,802	-88,802	100,000	100,000	15,089	0	84,911	2,023	0	11,382
B-Part: Common program.	332,958	-107,958	650,000	875,000	465,069	225,000	184,931	62,338	30,159	24,788
Preparedness	968,529	0	1,500,000	2,468,529	934,061	1,534,468	0	125,203	205,682	0
Measurement	1,046,280	0	860,000	1,906,280	781,276	1,125,004	0	104,723	150,797	0
Radioecology	245,000	0	760,000	1,005,000	500,000	505,000	0	67,021	67,691	0
Waste	360,000	0	0	360,000	240,000	120,000	0	32,170	16,085	0
CfP 2012 rest.	300,000	0	0	300,000	0	0	300,000	0	0	40,212
Travel young scientists	100,000	-100,000	100,000	100,000	10,487	0	89,513	1,406	0	11,998
Website renewal	90,000	0	0	90,000	89,465	0	535	11,992	0	72
Fukushima	100,000	0	100,000	200,000	60,359	0	139,641	8,091	0	18,718
NSFS 2012	-10,243	10,243	0	0	0	0	0	0	0	0
Fee Secretariat	1,750	-1,750	590,000	590,000	597,000	0	-7,000	80,023	0	-938
Fee Chairman incl. travels	0	0	420,000	420,000	420,000	0	0	56,297	0	0
Reports etc.	6,851	-6,851	30,000	30,000	8,830	0	21,170	1,184	0	2,838
Postage etc.	-1,778	1,778	10,000	10,000	6,705	0	3,295	899	0	442
Equipment	3,137	-3,137	15,000	15,000	0	0	15,000	0	0	2,011

Notes

	DKK							EURO	7,4604	
Specifikation:	Budget from 2012	Returned 2012	Budget 2013	Total budget 2013	Payments made	Contracts signed	Rest budget	Payments made	Contracts signed	Rest budget
Internet	40,000	-40,000	90,000	90,000	84,531	0	5,469	11,331	0	733
Auditing	-4,688	4,688	55,000	55,000	55,000	0	0	7,372	0	0
Information material	14,873	-14,873	30,000	30,000	22,465	0	7,535	3,011	0	1,010
Various	-4,371	4,371	20,000	20,000	7,266	0	12,734	974	0	1,707
Travels Secretariat	1,188	-1,188	10,000	10,000	9,532	0	468	1,278	0	63
Diff.	0	0	0	0	-2	0	2	0	0	0
Total	5,789,763	-489,953	9,890,000	15,189,810	8,563,914	5,595,722	1,030,174	1,147,916	750,057	138,087
	F_1	F_2	F_3	F	G	H_1	H_2	G	H_1	H_2

$F_1 + F_2 + F3 = F$ $F - G = H = H_1 + H_2$

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The Nordic Nuclear Safety Research Programme (NKS)

Long-form audit report of 9 April 2013 regarding Financial Statements for 2012

Long-form audit report of 9 April 2013 regarding Financiel Statements for 2012

Contents

Long-form audit report of 9 April 2013 regarding Financiel Statements for 2012

1 Audit of the financial statements

1.1 Introduction

As the appointed auditors for The Nordic Nuclear Safety Research Programme (NKS), we have audited the financial statements for the financial year 1 January 2012 - 31 December 2012 prepared by the NKS Secretariat.

The financial statements show the following results, assets and equity:

DKK / EUR	Current year	Last year
Result for the year	638,255 / 85,552	1,694,051 / 227,873
Equity	8,778,501 / 1,176,680	8,140,246 / 1,094,973

1.2 Conclusion on the executed audit – auditor's report

The audit performed has not given rise to significant remarks to the financial statements.

If the financial statements are carried in the existing form and if further, significant information does not appear during management's processing, we will provide the financial statements for 2012 with an unmodified audit opinion.

The audit has not included the management's review, but we have read through the management's review. This has not given rise to remarks. On this background, it is our opinion that the information in the management's review is in accordance with the financial statements.

1.3 Scope and execution of the audit

The purpose, planning and execution of the audit, the auditor's responsibility and reporting as well as the board's responsibility have remained unchanged, which is why we refer to our letter of engagement dated 30 March 2011.

As preparation for the audit of the financial statements for 2012, we have discussed the expectations to the financial development for 2012 with the Secretariat, including risks related to the association's activities. We have, furthermore, discussed risks connected to the presentation of accounts and the initiatives the board has initiated for the management hereof.

On this background, we have prepared our auditing strategy with a view to targeting our work at significant and areas of risk. We have identified the following items and areas to which, according to our opinion, special risks of significant errors and insufficiencies in the financial statements are associated:

- Subsidy
- Project expenses
- Giro accounts

On other areas, the risk of error in the financial statements is assessed as normal and the execution of the audit has therefore had a lesser scope.

The audit was executed with a view to verifying whether the information and amount specifications in the financial statements are correct. Analyses, review and assessment of administrative procedures, internal control systems and control procedures have been performed as well as a review and assessment of bookkeeping items and documentation for this.

The audit has also included an assessment of whether the prepared financial statements fulfil the auditing regulations of legislation and articles of association. In this regard, we have assessed the selected accounting policy, the board's accounting opinion as well as, moreover, the information submitted by the board.

Furthermore, the audit has been planned and executed in accordance with the international auditing standards as well as generally accepted government auditing standards and, in addition to the financial audit, it also includes a review and assessment of whether due financial considerations have been taken with the administration of the funds covered by the accounts.

During the execution of the financial audit, we have checked whether the accounts are without significant errors and insufficiencies. We have also checked the financial statements' agreement with the underlying bookkeeping records as well as the financial statements' concordance with laws and regulations as well as with commenced agreements and usual practice.

The performance audit has been executed as an integrated and parallel part of the financial audit and, among other things, has included random reviews of agreements and contracts, reports, analyses of expense and income items as well as an analysis of budget deviations.

The audit has been executed in connection with the preparation of the financial statements.

2 The executed audit

2.1 Administration

Similar to last year, The NKS Secretariat is managed by FRIT ApS.

Agreement has been entered into on an extension of the agreement until 30 June 2014.

In connection with our audit we have established that in May 2012, the Secretariat had performed a single transfer between the bank accounts in the Nordic countries.

This was done to minimise the risk of foreign exchange loss in connection with possible foreign exchange increases and decreases.

It must also be noted that the Board has chosen to extend the agreement with Chairman of the Board, Sigurður M. Magnússon, up to and including 2016.

2.2 Attestation procedures

We have performed a follow-up on NKS Secretariat's procedures and internal controls regarding attestation procedures and have found reason to state the following:

Project expenses

We checked on a sample basis whether the supporting documentation is duly approved by the programme manager or by chairman, Sigurður M. Magnússon. This review has not given rise to any comments.

In addition, we have established that the Secretariat regularly sends programme status to the programme managers. The programme status is forwarded approximately every second month and at the latest on 31 January 2013. The programme status includes, for example, a ledger card for project expenses so that the programme manager can see the individual payments on the project for the current year.

Secretariat expenses

Remuneration for the Secretariat is controlled as per agreement. We checked on a sample basis whether the invoices has been approved by Sigurður M. Magnússon. This review has not given rise to remarks.

2.3 Authorisation to sign

The accounts manager, Finn Physant, owner of FRIT ApS, and chairman, Sigurður M. Magnússon, have authority to make withdrawals on NKS' giro and bank accounts jointly or individually together with Claus Rubin, who is a consultant for FRIT ApS.

Our assessment is that the above terms and conditions for authorisation to sign, in consideration of the few staff members, is appropriately organised.

2.4 Use of IT

In connection with our audit, we have performed a general review and assessment of the association's administrative use of IT, including of system, data and operation security.

Our assessment is that the association is dependent on IT in the daily business processes. However, the association's use of IT is not assessed as being a risk.

2.5 Non-corrected misstatements

Pursuant to the international auditing standards, we must account for non-corrected misstatements that are not insignificant, to the association's senior management.

All amount errors and insufficiencies in the financial statements are corrected in cooperation with the NKS Secretariat.

2.6 Discussions with management on fraud

During the audit we have enquired the Secretariat about the risk of fraud and the Secretariat has informed us that according to their assessment, there is no particular risk that the financial statements can contain significant erroneous information as a result of fraud.

The Secretariat has, furthermore, reported that they do not have knowledge of fraud or investigations in progress for assumed fraud.

During our audit we have not established conditions that could indicate or arouse suspicion of fraud of significance to the information in the financial statements.

3 Comments to the audit and financial statements 2012

For the individual items in the income statement and balance sheet we can supplement the presented financial statements for the year 2012 with the following:

3.1 Additional financiers

The additional financiers stated in the income statement may be analysed as follows:

	2012	2011	2010
Fortum Power and Heat Oy, Finland	167,270	162,804	154,783
TVO, Finland / Teollisuuden Voima Oyj, TVO	167,270	162,804	154,783
Fennovoima Oy, Finland	52,039	52,180	44,649
Forsmarks Kraftgrupp AB, Sweden	92,184	84,086	79,996
Kärnkraftsäkerhet och utbildning (KSU), Sweden	87,909	80,135	79,996
OKG Aktiebolag, Sweden	83,857	84,086	79,996
Ringhals AB, Sweden	87,909	80,135	79,996
IFE, Norway	81,776	80,135	79,996
Total additional financiers	820,214	786,365	754,196

The additional financiers are in accordance with the supporting documentation.

3.2 Interest income, exchange rate adjustments and other income

The item can be specified thus:

	2012	2011	2010
Interest income	114,601	124,641	31,363
Exchange rate adjustments	231,168	-72,519	372,559
	345,769	52,122	403,922

The exchange rate adjustments are mainly the result of foreign currency amounts being registered at the rate on 31 December 2011 throughout 2012. This gives deviations between the utilised rate and the actual rate.

We can report that the principle used does not affect the overall results, but just the allocation of the individual items in the income statement.

3.3 Budget balances brought forward from one year to the next

In the financial survey for 2012, budget figures for all expenses are specified. In addition, an amount transferred from 2011 of, in total, DKK 5,299,810; cf. the accounts pages 8 to 10, first two columns.

We draw attention to the fact that the remaining budget for joint programme expenses and joint trips, similar to previously, have not been transferred from 2011 to 2012 and are thus transferred to NKS' equity (reserve).

It is furthermore noted that the coordination and travel expenses as well as activity expenses granted to the programme managers for the year 2012 that are not used/allocated similar to last year will be transferred to equity. Thus, only the allocated activity expenses for R Part and B Part will be transferred from the one year to the next.

The allocated funds for a Fukushima seminar will also be transferred from 2012 to 2013.

4 Performance audit

In accordance with generally accepted government auditing standards, we checked, for a number of selected areas, whether NKS has established business processes to ensure appropriate management of allocated funds. We performed our audit procedures to obtain limited assurance as to whether the management is conducted in a financially appropriate manner and whether the performance numbers disclosed are documented and adequate to cover NKS' operations in 2012.

According to our information, the grants (except for the grants contributed by Fortum Power and Heat Oy and TVO) are not earmarked for specific projects but for NKS' programmes as such. Based on this information, our audit was conducted on the basis of NKS' activities as a whole. During our audit,

we checked that the grants from Fortum Power and Heat Oy and TVO have been employed as intended.

During our audit, we established that expenses incurred relate to individual projects and that the supporting documentation is duly approved. We noted that the programme and Secretariat budgets are kept. Finally, we checked on a sample basis whether reports have been prepared for completed projects.

As part of the performance audit, we must check whether the individual projects could be carried out in a more economical manner / efficiency. During our audit, no matters have come to our attention that cause us to believe that this is the case. However, we must state that our lack of technical expertise within nuclear safety means that we do not have the possibility to comment on this.

4.1 Management of funds

We have previously recommended the placement of available funds in another way than in giro accounts in order to achieve greater rate of return.

The year's interest income is calculated at TDKK 115, which is a reduction of TDKK 10 compared to 2011. This is due to a reduction in the interest rate percentage and in the length of the period of commitment. On the date of the presentation of accounts, the rate of return on available cash accounts is the following:

Danske Bank, DK	0% p.a. on the entire deposit
DnB NOR, NO	Between 0% - 3.0% p.a. depending on the size of the deposit
Nordea, SE	Between 1% - 1.89% p.a. depending on the size of the deposit
SAMPO Bank Abp, FI	0% p.a. on the entire deposit

4.2 Agreement between bookkeeping records and financial statements

We noted that there is agreement between the performed bookkeeping and the prepared financial statements for the year 2012.

Similar to previous years, all deposits and payments in January 2013 have been included in the accounts as if they were settled before 31 December 2012. This utilised accounting policy does not affect the accounting result. Only the size of the cash available, receivables and debt are affected.

5 Statutory information, etc.

We have ascertained that on all essential areas, the association complies with the Danish Bookkeeping Act, including regulations on the storage of accounting records.

It is our opinion that the requirements of legislation on bookkeeping and storage of accounting records have been complied with. We have furthermore agreed that our archive material will be stored for 10 years after the expiry of the relevant financial year.

6 Economic crime

In accordance with the Danish Act on Approved Auditors and Audit Firms, we are obliged to check whether any management member has committed significant economic crime and under certain circumstances we must report our findings to legislative and enforcing authorities (primarily the Serious Economic Crime Squad).

During our audit we have not come across conditions or indications that any management member have committed economic crimes.

7 Other tasks

In this financial year we have provided the following other services to NKS:

- Assistance with the preparation of the financial statements

A fee for the audit of the financial statements has been agreed on, including assistance with the preparation of the financial statements, participation in accounting meetings and in board meetings as well as the translation to English of the accounts and long-form audit report, in the amount of DKK 46,000 excl. VAT. The amount has not been allocated as debt in the presented accounts.

Long-form audit report of 9 April 2013 regarding Financiel Statements for 2012

8 Statements in connection with the audit
8.1 The managements representation letter

As part of the audit of the financial statements, we have obtained confirmation from management of the financial statements' completeness, including that they contain all information on mortgages, guarantees, related parties, court cases, events after the balance sheet date as well as other complex auditable areas.

Management has further declared that all errors that have been presented to management are rectified in the financial statements. We have ascertained that the rectifications are included.

8.2 Auditor's statement

In compliance with the law regarding the approved auditors and audit firms, we state that:

- We comply with the statutory requirements for independence, and
- during the audit carried out, we have received all the information we have requested.

Roskilde, 9 April 2013

Dansk Revision Roskilde
Godkendt revisionsaktieselskab

Palle Sundstrøm
Partner, state-authorised Public Accountant

Presented at the board meeting on 28 May 2013

Sigurður M. Magnússon
Chairman

Steen Cordt Hoe

Jorma Aurela

Ole Harbitz

Eva Simic

Financial status - 13 May 2013

Incomes

DKK

Expected incomes this year	9.230.566	A = B + C
Received until now	8.700.877	B
Additional payments	529.689	C
Cash balance	13.705.550	D
Available funds	14.235.239	E = C + D

Budget and expenses

DKK

Total budget incl. transfer from earlier years	15.404.571	F = G + H
Paid until now	3.779.421	G
Rest budget incl. contracts	11.625.150	H

Available

DKK

Reserve available for the board	2.610.089	I = E - H

Financial programme specification - 13 May 2013

	DKK							EURO		
								Rate 7,4604		
Total	Budget from 12	Returned 12	Budget 13	Total budget 13	Payments made	Contracts signed	Rest budget	Payments made	Contracts signed	Rest budget
R-Part	2.343.131 1)	-256.881	4.720.000	6.806.250	1.843.500	4.662.750	300.000	247.105	625.000	40.212
B-Part	4.083.916	-274.444	3.185.000	6.994.472	1.013.597	5.386.222	594.653	135.864	721.975	79.708
Activity support	140.176	-535	149.208	288.849	50.690	0	238.159	6.795	0	31.923
Fees	-7.000	7.000	1.055.000	1.055.000	740.600	0	314.400	99.271	0	42.143
Common programme exp.	65.203	-65.203	250.000	250.000	128.621	0	121.379	17.240	0	16.270
Travels	468	-468	10.000	10.000	2.412	0	7.588	323	0	1.017
I alt	6.625.894	-590.531	9.369.208	15.404.571	3.779.420	10.048.972	1.576.179	506.598	1.346.975	211.273
	F_1	F_2	F_3	F	G	H_1	H_2	G	H_1	H_2

$F_1 + F_2 + F3 = F$

$F - G = H = H_1 + H_2$

1) In the budget 2012 figure of DKK 2.343.131 for the R-Part, an amount of DKK 100.000 of the B-Part's budget is included in the budget for the RASTEP activity

Detailed financial programme specification - 13 May 2013

	DKK							EURO		7,4604
Specifikation:	Budget from 12	Returned 12	Budget 13	Total budget 13	Payments made	Contracts signed	Rest budget	Payments made	Contracts signed	Rest budget
R-Part: Common program.	396.970	-171.970	670.000	895.000	0	695.000	200.000	0	93.159	26.808
Activities	1.861.250	0	3.950.000	5.811.250	1.843.500	3.967.750	0	247.105	531.841	0
Travel young scientists	84.911	-84.911	100.000	100.000	0	0	100.000	0	0	13.404
B-Part: Common program.	409.931	-184.931	670.000	895.000	226.645	470.000	198.355	30.380	62.999	26.588
Preparedness	1.534.468	0	570.000	2.104.468	215.000	1.889.468	0	28.819	253.266	0
Measurement	1.125.004	0	965.000	2.090.004	292.250	1.797.754	0	39.174	240.973	0
Radioecology	505.000	0	880.000	1.385.000	276.000	1.109.000	0	36.995	148.652	0
Waste	120.000	0	0	120.000	0	120.000	0	0	16.085	0
CfP 2011 rest.	300.000	0	0	300.000	0	0	300.000	0	0	40.212
Travel young scientists	89.513	-89.513	100.000	100.000	3.702	0	96.298	496	0	12.908
Website renewal	535	-535	0	0	0	0	0	0	0	0
Fukushima	139.641	0	0	139.641	50.690	0	88.951	6.795	0	11.923
Translation project	0	0	149.208	149.208	0	0	149.208	0	0	20.000
Fee Secretariat	-7.000	7.000	615.000	615.000	300.600	0	314.400	40.293	0	42.143
Fee Chairman incl. travels	0	0	440.000	440.000	440.000	0	0	58.978	0	0
Reports etc.	21.170	-21.170	30.000	30.000	8.770	0	21.230	1.176	0	2.846
Postage etc.	3.295	-3.295	7.500	7.500	2.691	0	4.809	361	0	645
Equipment	15.000	-15.000	15.000	15.000	0	0	15.000	0	0	2.011
Internet	5.469	-5.469	90.000	90.000	38.398	0	51.602	5.147	0	6.917
Auditing	0	0	57.500	57.500	45.000	0	12.500	6.032	0	1.676
Information material	7.535	-7.535	30.000	30.000	30.259	0	-259	4.056	0	-35
Various	12.734	-12.734	20.000	20.000	3.503	0	16.497	470	0	2.211
Travels Secretariat	468	-468	10.000	10.000	2.412	0	7.588	323	0	1.017
Diff.	0	0	0	0	1	0	-1	0	0	0
Total	6.625.894	-590.531	9.369.208	15.404.571	3.779.421	10.048.972	1.576.178	506.598	1.346.975	211.274
	F_1	F_2	F_3	F	G	H_1	H_2	G	H_1	H_2

$F_1 + F_2 + F3 = F$ $F - G = H = H_1 + H_2$

NKS-R STATUS REPORT

Kaisu Leino
NKS-R Programme Manager
May 2013

Table of Contents

1 Status summary

This report gives a short overview and summary of the current status of the NKS-R program. Overall the work in NKS-R is progressing well. Since the last NKS Board meeting, 5 final reports from the NKS-R activities have been completed and published on the NKS website. Submit of some final reports from activities started in 2012 have been delayed, new schedules have been agreed. Contract have been agreed and signed with all activities started in 2012. All activities initiated earlier than 2012 have been finished.

1.1 Seminars

Two NKS-R seminars will be held this year: Decommissioning seminar 2013 and a seminar concerning DIGREL activity. The decommissioning seminar will be held 6-7th November 2013 in Halden. The DIGREL seminar will be held in the autumn, probably in October or November.

1.2 Young scientist travel support

No claims have been received this year. PC tries to find new channels to promote NKS to the young scientist. Young scientist travel support have been advertised on the NKS Facebook group.

1.3 Published reports

The following reports have been published on the NKS reports since the last board meeting in January. The latest published NKS-R reports consist only of the activities' final reports. Some of the activities prepare join reports with all the participants, when some activities prefer to write individual final reports. Lappeenranta University of technology (LUT) has divided their final report to two parts (NKS-280 and NKS-281). This is result of the other funding programs reporting requirements.

NKS-277	March 2013	Guidelines for reliability analysis of digital systems in PSA context — Phase 3 Status Report	DIGREL
NKS-278	April 2013	Safety culture in design	SADE
NKS-279	April 2013	Final report of MoReMO 2011-2012. Modelling Resilience for Maintenance and Outage	MoReMo
NKS-280	May 2013	PIV MEASUREMENTS AT THE BLOWDOWN PIPE OUTLET	ENPOOL-LUT
NKS-281	May 2013	PPOOLEX EXPERIMENTS ON THE DYNAMICS OF FREE WATER SURFACE IN THE BLOWDOWN PIPE	ENPOOL-LUT

2 Activities initiated in 2012

Nine activities were initiated in 2012. All the activities were initiated according the normal schedule in January, even the RASTEP activity, which followed individual schedule in 2011. Seven of the initiated activities are continuing activities and two are new.

Only two final reports are missing in 2012 activities. Final report of the DECOSE activity is expected to be delivered soon. The final report of the cross-over RASTEP activity is promised to be delivered in August 2013. Table 1 gives an overview of the status of 2012 NKS-R activities.

Table 1. NKS-R 2011 activities

Activity	Description	First invoice	Report	Second invoice	Report number
AIAS	Ad-/absorption and desorption/revaporisation behaviour of iodine aerosols on containment surface materials	x	x		
DECOSE	Debris coolability and steam explosion	x			
DIGREL	Guidelines for reliability analysis of digital systems in PSA context	x	x	x	NKS-277
ENPOOL	Experimental and numerical studies on suppression pool issues	x	x		NKS-280 NKS-281
MoReMO	Modelling resilience for maintenance and outage	x	x		NKS-279
Nordic-Gen4	Nordic nuclear forum for generation IV reactors	x	x	x	NKS-270
POOLFIRE	Predictive analysis of pool fires in enclosures by means of CFD models for risk assessment of nuclear power plants	x	x		
SADE	Safety culture in design and implementation of technological and organisational solution - improving resilience of the sociotechnical system through the life-cycle	x	x		NKS-278
RASTEP (cross-over activity R/B)	Using bayesian belief network modelling for rapid source term prediction after a severe accident	x	August 2013		

3 Activities initiated in 2013

Ten activities were started in 2013. Five are continuing activities and five are new. Contracts have been signed and agreed with all of these. In this chapter short description is given of all the activities. For more detailed status reports see attachments.

3.1 Decom-sem

Decom-sem:
Decommissioning seminar 2013
Activity leader: Niels Kristian Mark, Institutt for energiteknikk (IFE)

NKS-R funding: 200 kDKK

Milestones:
1. Project start (January 2013)
2. Meeting of the organizing committee (January 2013)
3. Call for abstracts (February 2013)
4. Invitations to the seminar distributed (February 2013)
5. Meeting of the organizing committee (May 2013)
6. Seminar (November 2013)

Status
The date and place for the seminar has been settled, and the seminar will be held 6-7th November in Halden. The location for the seminar, lunch and dinner have been decided and reserved. Program

committee has started to work with seminar program, invitations, dead-lines, which should be completed in May.

3.2 DECOSE

DECOSE
Debris coolability and steam explosion
Activity leader: Pavel Kudinov, Kungliga Tekniska Högskolan

NKS-R funding: 500 kDKK

Tasks:
Task 1. Investigation of the effect of geometry on coolability in 2D debris bed
Task 2. Investigation of the effect of debris agglomeration on coolability
Task 3. Investigation of the effect of initial pool subcooling on coolability
Task 4. Investigation of particulate debris spreading
Task 5. Investigation of the effect of the heaters' geometry on the DHF
Task 6. Development of advanced instrumentation
Task 7. Joint analytical activity on debris bed coolability
Task 8. Analysis of steam explosion in a Nordic BWR containment

Milestones:
1. Report on experimental and analytical work performed by VTT on COOLOCE experiments
2. Report on experimental work performed by KTH
3. Report on the DECOSIM code development and validation
4. Report on analysis of steam explosion in Nordic type BWRs by KTH and VTT

Status
The work is being done at KTH and VTT. The work have been started in both organisations as planned. All the tasks have been started and are progressing well. For more detailed status see attachement.

3.3 DIGREL

DIGREL
Guidelines for reliability analysis of digital systems in PSA context
Activity leader: Jan-Erik Holmberg, VTT Technical Research Centre of Finland

NKS-R funding: 300 kDKK

Milestones:
1. Kick-off meeting on software modelling and quantification
2. WGRISK task group meeting and WGRISK annual meeting in Paris
3. Final draft of the WGRISK guidelines
4. Final WGRISK guidelines
5. NKS (Nordic) seminar on software modelling and quantification
6. NKS report on software modelling and quantification

7. Final draft of the NKS report and seminar (covering all activities 2010 - 14)
8. NKS final report on guidelines of reliability analysis of digital I&C systems in PRA

Status
Activity is running on schedule. Taxonomy report have been updated. Two paper was written to PSA Castle meeting 2013, which was held in April. Generic digital I&C system example model have been updated slightly. Overall progress is 25 %.

3.4 DPSA

DPSA
Deterministic-Probabilistic Safety Analysis Methodology
Activity leader: Pavel Kudinov, Kungliga Tekniska Högskolan

NKS-R funding: 400 kDKK

Milestones:
1. Results of feasibility study on connection between conventional PSA, DSA and DPSA methods
2. Mapping, information collection and identification of areas of certain interest based on existing PSA
3. State of the art review of the probabilistic, deterministic and combined DPSA analysis
4. Results of analysis of core relocation scenarios taking into account timing of PSA Level 1 events and possible recovery actions on the melt conditions in the lower head

Status
DPSA work is being done at KTH, VTT and Scandpower. The work is progressing on schedule. All organizations have started working with all the milestones. See attachment for more detailed information.

3.5 ENPOOL

ENPOOL
Experimental and numerical studies on suppression pool issues
Activity leader: Timo Pättikangas, VTT Technical Research Centre of Finland

NKS-R funding: 600 kDKK

Deliverables of VTT:
1. CFD simulation of chugging in a PPOOLEX experiment with detailed temperature measurements
2. Fluid-Structure Interaction calculation of a PPOOLEX experiment
3. FEM calculation on the statistics of the structural response of a BWR containment
4. Report on the CFD and FEM calculations.

Deliverables of KTH:
1. Further development of the Effective Heat Source and Effective Momentum Source models.
2. Validation of the models against latest available PPOOLEX data.
3. Pre- and post- test simulations of the new series PPOOLEX tests.
4. Report on the model development and validation.

Deliverables of LUT:
1. Execution of the experiment series on mixing
2. Reporting of the mixing experiments
3. Execution of the experiment series on DCC
4. Reporting of the DCC experiments
5. Delivery of relevant experiment data to the simulation partners.

Status
VTT: CFD simulations of chugging in a PPOOLEX experiments has been performed (1), fluid-structure interaction calculation of a PPOOLEX has been started (2). Deliverables 3 and 4 are to be started later.
KTH: The development of the analytical model for prediction of amplitude and frequency of water level oscillation inside the blowdown pipe during chugging is ongoing (1), validation of the models is started (2), preparations for pre-test calculations are ongoing (3). Report will be written later (4).
LUT: Facility preparations for the tests are under way (1), the PIV measurement system is being tested with laser-induced particles and special filters (3). Deliverables 2, 4, and 5 have not been started.

3.6 Exam HRA

Exam HRA
Evaluation of existing applications and guidance on methods for human reliability analysis
Activity leader: Gunnar Johansson

NKS-R funding: 200 kDKK

Milestones:
1. Project seminar 1
2. Presentation of guidance document with requirements on HRA scope
(3. Project seminar 2)
(4. Presentation of guidance document with requirements on HRA methods)
(5. Summary report supported by separate task reports as appendences)

Status
The work is planned to for 20 months, however, the NKS funding is allocated for a year. Milestones 3-5 planned to be performance in 2014. The first project seminar will focus on status reporting and the development regarding guidance on scope of HRA applications. The seminar will be arranged in autumn 2013. The work progress so far: 2 work group seminar have been carried out.

3.7 HUMAX

HUMAX
Maximizing human performance in maintenance
Activity leader: Maren H. Rø Eitrheim, Institutt for energiteknikk (IFE)

NKS-R funding: 500 kDKK

Milestones:

1. Literature review
2. Case studies at Nordic NPP's
3. Survey to plants outside of the Nordic countries
4. Data analysis
5. Dissemination seminars
6. Final report

Status
The project is progressing according to plan. The literature review have been performed and discussed, and work on the three cases studies has been initiated. The project comprises three case studies. Interviews are planned to initiate before the summer vacation in Ringhals and Loviisa. Data gathering in TVO is planned to take place after the summer vacation.

3.8 L3PSA

L3PSA
Addressing off-site consequence criteria using level 3 PSA
Activity leader: Anders Olsson, Scandpower AB

NKS-R funding: 390 kDKK

Milestones:
1. Industry and Literature Survey
2. Appropriate Risk Metrics
3. Regulation, guides and standards
4. Pilot Application including tools for dispersion and consequence analysis
5. Development of a Guidance document

Status:
Two project meeting have been held. Project plan has been written. Scandpower leads the project but different organizations will take lead in different milestones. ES-konsult will take care of industry and literature survey, Risk Pilot leads appropriate risk metrics study, Scandpower leads regulation, guides and standards task and VTT takes care of pilot application.

3.9 POOLFIRE

POOLFIRE
Predictive analysis of pool fires in enclosures by means of CDF models for risk assessment of NPPs
Activity leader: Patrick Van Hees, Lund University

NKS-R funding: 360 kDKK

Milestones:
1. Implementation in case study
2. Workshop
3. Final report

Status

Number of fire test have been performed by Lund university. Modelling of the test campaign performed in 2012 is being done in Lund at the moment. The project is running as planned.

3.10 SADE

SADE
Safety culture in design - improving resilience throughout the life-cycle of nuclear power plant
Activity leader: Luigi Macchi, VTT Technical Research Centre of Finland

NKS-R funding: 500 kDKK

Milestones:
1. Selection of design case studies
2. Review and analysis of case studies
3. Workshop with experts

Status
Power companies have been contacted in Sweden and Finland. At the moment only one Finnish power company has authorised the case study. Three individual interviews and one group interview has been conducted. The transcription of the interviews and their translation into English is in progress. Regular meetings have been held within the project team. Delay in conducting the case studies due to difficulties in gain access and authorisation by the power companies.

4 Overview of all NKS-R activities 2009-2012

Last NKS board meeting in January PCs were asked to report the status of old NKS activities. At the coordination group meeting in April it was decided that PCs make a list of all activities started in 2009-2012. It is seen from the table below that only two NKS-R activities are unfinished. Activity is considered to be started after the January board meeting, and ended when the final report have been delivered.

Activity	NKS number	Started	Ended
HRA-Guidance	NKS_R_2009_73	01/2009	12/2010
IACIP	NKS_R_2008_61	01/2009	12/2009
INCOSE	NKS_R_2009_75	01/2009	04/2010
MOSACA	NKS_R_2008_69	01/2009	02/2010
NOMAGE4	NKS_R_2008_63	01/2009	03/2010
NROI	NKS_R_2008_70	01/2009	05/2010
POOL	NKS_R_2007_58	01/2009	09/2010
POOL(KTH)	NKS_R_2007_58	01/2009	10/2010
POOL(NUM)	NKS_R_2007_58	01/2009	12/2010
Safety Goal	NKS_R_2005_44	01/2009	12/2010
WASCO	NKS_R_2005_43	01/2009	12/2009
Decom-sem	NKS_R_2010_83	01/2010	12/2010
DIGREL	NKS_R_2010_86	01/2010	12/2010
IACIP	NKS_R_2008_61	01/2010	12/2010
INCOSE	NKS_R_2009_75	01/2010	05/2011
MOSACA10	NKS_R_2008_69	01/2010	01/2011
NROI	NKS_R_2008_70	01/2010	04/2011
POOL VTT	NKS_R_2007_58	01/2010	05/2011
POOL KTH	NKS_R_2007_58	01/2010	06/2011
POOL LUT	NKS_R_2007_58	01/2010	03/2011
AIAS	NKS_R_2011_98	01/2011	12/2012
DIGREL	NKS_R_2010_86	01/2011	01/2012
ENPOOL	NKS_R_2011_90	01/2011	03/2012
ENPOOL	NKS_R_2011_90	01/2011	05/2012
ENPOOL	NKS_R_2011_90	01/2011	05/2012
MoReMO	NKS_R_2011_95	01/2011	02/2012
NOMAGE4	NKS_R_2008_63	01/2011	11/2011
POOLFIRE	NKS_R_2011_96	01/2011	02/2012
SADE	NKS_R_2011_97	01/2011	03/2012
RASTEP	NKS_R_2010_87	06/2011	09/2012
AIAS	NKS_R_2011_98	01/2012	05/2013
DECOSE	NKS_R_2012_100	01/2012	unfinished
DIGREL	NKS_R_2010_86	01/2012	02/2013
ENPOOL VTT	NKS_R_2011_90	01/2012	04/2013
ENPOOL LUT	NKS_R_2011_90	01/2012	03/2013

ENPOOL KTH	NKS_R_2011_90	01/2012	05/2013
MoReMO	NKS_R_2011_95	01/2012	03/2013
Nordic-Gen4	NKS_R_2012_103	01/2012	11/2012
POOLFIRE	NKS_R_2011_96	01/2012	02/2013
RASTEP	NKS_R_2010_87	01/2012	unfinished
SADE	NKS_R_2011_97	01/2012	03/2013

Attachments

A1. Status report Decom-sem

Institute for Energy Technology

Note

To: Kaisu Leino
Programme Manager NKS-R

From: Niels-Kristian Mark (Institutt for energiteknikk, Halden),
Project manager for Decom-sem, Decommissioning seminar 2013, NKS_R_2013_106

Copy:

Date: 2013-05-06

Status report for
Decom-sem, Decommissioning seminar 2013, NKS_R_2013_106

This is the status of the preparations for the Decom-sem:

1) The contract between IFE and NKS was signed 11th February 2013.
2) IFE invoiced 7th February NKS for the first 50% of the total budget. That is DKK 100.000,-.
3) The committee responsible for arranging the seminar consists of:
   - Niels-Kristian Mark (project manager), IFE.
   - Anders Appelgren, ndcon (Studsvik):
   - Anne Sørensen, Dansk Dekommissionering.
   - Eurajoki Tapani, Fortum.
   - Naeem Syed, NRPA.
4) The date and place for the seminar has been settled: Wednesday-Thursday 6-7th November in Halden.
5) IFE has made an overall programme for the seminar meaning that the following has been decided: The location for the seminar, lunch and dinner. The locations have been reserved and a number of rooms booked in advance at the hotel.
6) IFE, DD, Fortum and NRPA will now start working the programme, invitation, dead-lines etc. and start announcing the seminar. This should be completed in May.

IFE, P.O. Box 173, NO-1751 Halden, Norway Page 1 of 1

A2. Status report DECOSE

VTT progress in 2013 on the Deliverables:

1. COOLOCE experiments with cone on a cylindrical base (Task 1.c).

Modification of the conical test bed for the cone on a cylindrical base configuration with half of the radius of the conical bed has been started.
Pre-test simulations of the case to estimate the required heating power has been started.

2. COOLOCE experiment in cylindrical geometry with open side wall and a cake simulant (Task 2).

The experiment with the cylindrical debris bed with open sidewall and a cake simulant at 1-7 bar pressure have been done.

3. Continuation of feasibility studies for advanced instrumentation (Task 6).

Feasibility study is ongoing.

4. Code–to–code comparison and development of recommendations and best practice guidelines for analysis of debris bed coolability and validation against produced experimental data (Task 7).

The modelling work has not yet been started, except for the pre-test simulations.

5. Application of MC3D and TEXAS-V to analysis of steam explosion in a BWR containment (Task 8).

Training and learning with MC3D code is on-going. SERENA2 BWR reactor exercise with MC3D version 3.5 has been started while waiting to receive the 3.7 version during this year.
After this the work will be concentrated on comparison of the BWR calculations with the previous and the newer version.

6. Reporting of the COOLOCE experiments.

Reporting on the tests with cylindrical bed has been started.

7. Delivery of relevant experimental data to the simulation partners.

Not started yet.

KTH progress in 2013 on the Deliverables:

1. Evaluation of the effect of heater geometry and cake simulants on the DHF. Comparison of data from POMECO-HT and COOLOCE. POMECO-FL tests for effective particle diameter (Task 5, 2).

The dryout heat flux experiment with Zirconium Silicate beads is performed to study the uncertainty associated with the heaters geometry. In this way, the tests with two types of particles received from VTT are carried out.

2. DECOSIM code development. Code–to–code comparison and development of recommendations and best practice guidelines for analysis of debris bed coolability and validation against the experimental results produced in Tasks 5, 1.c, 2 and 3.

Validation of the DECOSIM code has been continued against existing COOLOCE data. The dryout powers for cylindrical (with impermeable walls) and conical debris beds were calculated and shown to be in reasonably good agreement with the experimental data. Simulations of cylindrical debris bed with permeable walls are under way. Validation to be continued as new data will become available from COOLOCE, POMECO-HT and POMECO-FL facilities.

3. Investigation of particulate debris spreading (Task 4.a).

Exploratory tests in PDS-C facility (which stands for particulate debris spreading – closures) have been carried out with stainless steel particles and zirconia-silica beads. A mock-up of the COOLOCE heaters and thermocouples has been manufactured. The tests with COOLOCE mock-up and zirconia-silica beads are ongoing to clarify the significance of the influence of heaters and TCs on particulate debris spreading rate. A model for particulate debris spreading using experimentally obtained closures for the particles flux Qp as a function of the gas flow rate through the bed Qg and local slope angle of the bed θ has been developed. Both, the explicit and implicit methods of solving of the model are available now.

4. DEFOR-A confirmatory series of tests with melt simulant material (Task 2).
Several DEFOR-A tests with melt simulant materials have been performed. Melt release through a plate with lower melting temperature material immersed under water was investigated in order to assess ablation of the hole. Experimental results obtained with lead plate suggest that no radial ablation of the nozzle is not observed, even if the plate itself is ablated in vertical direction by the melt. Further investigation will be carried out with different plate materials.

5. Application of MC3D and TEXAS-V to analysis of steam explosion in a BWR containment (Task 8).
Initially, the steam explosion calculations in the flooded drywell of Nordic BWR were carried out to check the loads on the side walls. The conditions were considered according to the SERENA II BWR reactor case exercise.
The calculations to study the loads due to steam explosion on containment walls in Swedish BWR (modified geometry) are under progress. The present study also involves the extensive sensitivity analysis to see the effect of different parameters on the loadings.

6. Reporting of the POMECO-FL, POMECO-HT and PDS experiments and code development results.
Reporting has been started.

7. Delivery of relevant experimental data to the simulation partners.
Not started yet.

A3. Status report DIGREL

Task	Status
WGRISK activity (task group) focusing on the development of best practice guidelines on failure modes taxonomy for reliability assessment of digital I&C systems for PSA	Task Group meeting in Paris March 18-19 Status reported to OECD/NEA WGRISK Paris March 20-22, 2013 Taxonomy report updated One paper written to PSA Castle meeting 2013 (April 10–12 2013) Abstract submitted to ANS PSA 2013 conference (accepted) 30%
Development of the generic digital I&C system example and associated demonstration PSA-model	Model slightly updated One paper written to PSA Castle meeting 2013 (April 10–12 2013) 15%
Finnish-Swedish-German collaboration specifically on software modelling and quantification	Kick-off meeting in Stockholm January 8, 2013 Working report outlined Outline of the method developed 25%
Nordic end user workshop (Fall 2013)	0%
Interim report (public NKS report) (tentatively the work will be reported in 2013 by two reports - overall DIGREL report - software reliability report	0%

A4. Status report DPSA

STATUS REPORT OF NKS-DPSA
May 08, 2013

Work at Royal Institute of Technology (KTH)

Pavel Kudinov, Viet-Anh Phung, Kaspar Kööp, Sebastian Raub, Sergey Galushin, Yuri Vorobyev.

Deliverable 1: Results of feasibility study on connection between conventional PSA, DSA and DPSA methods
Approaches to identification of failure domain using DPSA tools and post processing of DPSA analysis data for characterization of failure domain is ongoing.
Task completion: 25 %

Deliverable 2: Mapping, information collection and identification of areas of certain interest based on existing PSA
Mapping of PSA-L1 scenarios into groups of early/late vessel failure at high/low pressure is ongoing. Identification of scenarios sensitive to timing of events in analysis of Nordic type BWR severe accidents for (i) in-vessel stage, (ii) vessel failure modes, and (iii) ex-vessel accident progression analysis is ongoing.
Task completion: 40 %

Deliverable 3: State of the art review of the probabilistic, deterministic and combined DPSA analysis
Review of the state of the art DPSA approaches is ongoing.
Task completion: 50 %

Deliverable 4: Results of analysis of core relocation scenarios taking into account timing of PSA Level 1 events and possible recovery actions on the melt conditions in the lower head
Analysis of core relocation process taking into account the influence of timing in vessel depressurization is ongoing with MELCOR code. Coupling of MELCOR with Genetic Algorithm GA-DPSA tool is ongoing.
Task completion: 30 %

Work at VTT

Jan-Erick Holmberg, Silvonen Taneli.

Deliverable 1: Results of feasibility study on connection between conventional PSA, DSA and DPSA methods
Feasibility of different approaches to data exchange between PSA and DPSA tools is under investigation.
Task completion: 15 %

Deliverable 2: Mapping, information collection and identification of areas of certain interest based on existing PSA
Materials for summary of current PSA-2 modeling approaches have been collected. Compilation of data relevant to Nordic type BWR design for (i) in-vessel stage, (ii) vessel failure modes, and (iii) ex-vessel accident progression analysis is ongoing.

Task completion: 50 %

Deliverable 3: State of the art review of the probabilistic, deterministic and combined DPSA analysis
Review of the state of the art PSA approaches and the needs for coupling with DPSA tools is ongoing.
Task completion: 15 %

Deliverable 4: Results of analysis of core relocation scenarios taking into account timing of PSA Level 1 events and possible recovery actions on the melt conditions in the lower head
Reference scenarios to be addressed with MELCOR and SPSA are under selection and consideration.
Task completion: 15 %

Work at Scandpower

Yvonne Adolfsson,

Deliverable 1: Results of feasibility study on connection between conventional PSA, DSA and DPSA methods
Feasibility of different approaches to data exchange between DSA and DPSA tools is under investigation.
Task completion: 15 %

Deliverable 2: Mapping, information collection and identification of areas of certain interest based on existing PSA
Work on summary of current PSA-2 modeling approaches for a reference Nordic type BWR design for (i) in-vessel stage, (ii) vessel failure modes, and (iii) ex-vessel accident progression analysis is ongoing.
Task completion: 20 %

Deliverable 3: State of the art review of the probabilistic, deterministic and combined DPSA analysis
Review of the state of the art DSA approaches and the needs for coupling with DPSA tools is ongoing.
Task completion: 20 %

Deliverable 4: Results of analysis of core relocation scenarios taking into account timing of PSA Level 1 events and possible recovery actions on the melt conditions in the lower head
Possibility of using MAAP code for analysis of core relocation scenarios is under investigation. A meeting with utilities to get a permission for using MAAP results is to be arranged.
Task completion: 5 %

A5. Status report ENPOOL

STATUS of ENPOOL-NKS ACTIVITIES, 5 April 2013

Work at Lappeenranta University of Technology (LUT), Markku Puustinen

Deliverable 1: Execution of an experiment series on mixing
Facility preparations for the tests are under way. The test series will be started when a detailed test plan has been agreed with KTH.

Deliverable 2: Reporting of the mixing experiments
No progress.

Deliverable 3: Execution of the experiment series on DCC
The PIV measurement system is being tested with laser-induced fluorescence (LIF) particles and special filters. The selection and procurement process of three high speed cameras is under way.

Deliverable 4: Reporting of the DCC experiments
No progress.

Deliverable 5: Delivery of relevant experiment data to the simulation partners.
No progress.

Work at VTT, Timo Pättikangas, Jarto Niemi, Antti Timperi and Michael Chauhan, VTT

Deliverable 1: CFD simulation of chugging in a PPOOLEX experiment with detailed temperature measurements
The direct-contact condensation model for chugging has been modified. Test simulation has been performed.

Deliverable 2: Fluid-Structure Interaction calculation of a PPOOLEX experiment
Modelling of the PPOOLEX experiment with the acoustic-structural FEM model has been just started. Different values for the pool damping have been tested and the pool dynamic behaviour has been briefly compared with the experiment.

Deliverable 3: FEM calculation on the statistics of the structural response of BWR containment
The subtask is to be started in July, when the responsible person returns from his vacation.

Deliverable 4: Report on the CFD and FEM calculations
To be written in December.

Work at Royal Institute of Technology (KTH), Hua Li, Walter Villanueva and Pavel Kudinov

Deliverable 1: Further development of the Effective Heat Source and Effective Momentum Source models.
The development of the analytical model for prediction of amplitude and frequency of water level oscillation inside the blowdown pipe during chugging is ongoing.

Deliverable 2: Validation of the models against latest available PPOOLEX data
Lumped modeling validation against 3 of the tests, MIX-01, MIX-02, and MIX-06 has been done as well as the validation with 2D wetwell against MIX-01. Validation against the rest of the tests are ongoing.

Deliverable 3: Pre- and Post-test simulations of the new series PPOOLEX tests
Preparations for pre-test calculations are ongoing.

Deliverable 4: Report on the model development and validation
No progress.

A6. Status report Exam HRA

Project Objective

The overall project objective is to provide guidance for a ”state of the art” Human Reliability Analysis for purposes of PSA to ensure that plant specific properties are properly taken into consideration in the analysis. This will also provide means to improve plant features based on HRA and PSA results.

Project funding

This project is partly funded by NKS and partly by Swedish, Finnish and Swiss utilities and the Swedish regulator SSM.

Time schedule/milestones

The ongoing phase of work was initiated in Oct 2012 and work is planned for 20 month.

Project tasks and reporting in the pipeline

This phase (3) of the project shall maintain and extend the assessments of existing HRA application and continue the analysis to provide interpretation of important plant features and identify good operational practices. The following case or task reports have been defined:

1. Reassessment of Manual Restoration of Residual Heat Removal System during full power operation.
2. Update of case report on Manual Depressurization of containment
3. Case report on Heavy load drop.
4. Case report on HRA methods or treatment of actions without procedures.
5. HRA method for Hazards.
6. Case report on Category B HRA – Initiator HRA.
7. HRA application guide.
8. Updated Aspect report (updated version of the Phase 2 summary report taking into account new aspects from phase 3.)
9. Update of the evaluation guide.

The following candidate case reports have been discussed and defined, but we have not yet decided if we shall initiate them.

10. Candidate case report on Makeup water to reactor vessel during outage (C12), also spent fuel pool as applicable, we needs more discussion with VRD/Ringhals
11. Candidate case report on Circulation Pump maintenance (C13), ready to start case study on this.
12. Candidate case on RCPB, still unclear if possible or interesting to do. Can the RCPB case be better defined or different? Check if we shall do depressurization case instead!

Progress reporting is made in the form of working group minutes, 2 WG meetings have been carried out so far, Forsmark, Nov 2012 and Mühleberg Feb 2013. In addition has a number of phone conferences, with minutes, been carried out. The minutes cover, work achieved, work in progress, work scheduled, critical items and action plans and are summarized here as work in the pipeline.

Deliverables

The results will be documented in a summary report supported by separate case and task reports as listed above. Two project seminars will be arranged for dissemination of results and project evaluation. The first seminar, fall 2013, will focus on status reporting and the development regarding guidance on scope of HRA applications, including the decision if to continue with Phase 3b. The second seminar, fall 2014, will focus on the guidance on methods and the choice of methods for HRA applications.

A7. Status report HUMAX

Project: Maximizing Human Performance in Maintenance (HUMAX)

Project Group: Pia Oedewald (VTT), Luigi Macchi (VTT), Nadezhda Gotcheva (VTT), Elina Pietikäinen (VTT), Christer Axelsson (RAB), and Ann Britt Skjerve (IFE, co-ordinator).

Milestones:

No.	Activities	Duration (planned)	Status
1	Literature review	January-Mach 2013	Complete draft
2	Case studies	March-October 2013	Initiated
3	Survey	August-October 2013	
4	Data analysis	August-November 2013	
5	Dissemination seminars	November 2013	
6	Final report	January 2014	

Overall status:

Overall, the project progresses according to plan, as far as I can judge. The literature review have been performed and discussed, and work on the three cases studies has been initiated (see further below).

The project work was formally initiated with a video-based kick-off meeting on February 27, 2013. During the meeting, common ground was established and an activity plan for the spring of 2013 was generated. On April 15, a joint work session was organized at Ringhals. The main purpose of the session was to obtain a shared understanding of the theoretical basis for the study and to coordinate the activities on three cases studies.

Status on the activities:

Ad 1) Literature review
A literature review has been carried out and documented in *complete draft* format. The scope of the review was to provide project members with a summarised presentation of the main assumptions and characteristics of the human performance programme movement.

Ad 2) Case studies
The project comprises three case studies. Data will be collected from interviews, observations, and possibly questionnaire surveys.

- **The Ringhals case:** Two draft interview guides have been completed. The plan is to initiate data collection (interviews) before the summer vacation. In all, we plan to interview 15-10 persons.
- **The TVO case:** A meeting has been scheduled with TVO on 20th May to plan the execution of the case study in more detail. The actual data gathering is planned to take place after the summer vacation.
- **The Loviisa case:** Meetings with the plant have been organised to specify the scope of a case study and select interviewees. According to the discussions the data collection will be started in May and nearly 30 persons will be interviewed during spring and summer.

A8. Status report L3PSA

Project funding
This project is partly funded by NKS and partly by Nordic and Finnish utilities and the Swedish regulator SSM. The work is being performed by Scandpower in cooperation with ES-konsult (Sweden), Risk Pilot (Sweden) and VTT (Finland). The Finnish participation funded also by the SAFIR program.

As of today work orders has been received from NKS, RAB and OKG and we have been told that work orders are in the process of being sent from SSM and FKA.

So - much of the funding is in place, but not all.

Project setup:
Since we are several organizations that are working in the project a project set-up meeting was held March 8 where we discussed which organization that will take lead in the different tasks. The decision was then made to split the lead for the different tasks according the following table:

Task	**Leading org.**
Task 0 – Industry Survey and Involvement	ES-konsult
Task 1 – Appropriate Risk Metrics	Risk Pilot
Task 2 – Regulation, guides and standards	Scandpower
Task 4 – Pilot application and tools	VTT
Task 3 – Guidance document	*Future task*
Project management	Scandpower

During this setup meeting it was also decided that a draft Project Plan and a draft Questionnaire should be developed that can be communicated with the funding members (project stakeholders). It was also decided that we shall arrange a separate meeting with the funding members where they are tasked to give their input on the project plan for the different tasks. How that work has progressed is described below.

Project Plan & Task 0 Questionnaire
Since the meeting 8 March each organization has made a first attempt to describe how the work will be performed within each task. Today, 3 April, a second project meeting between Scandpower, ES-konsult, Risk Pilot and VTT did take place where we discussed the project plan and set up a deadline for the development of this. The time schedule that we have agreed upon is as follows:

Week 15 – All organizations should have their tasks described in draft format
Week 16 – All organizations are given the opportunity to comment on the other tasks
Week 17 – A first draft version of the project plan to be completed
Week 18 – The first draft of the project plan to be distributed to the funding members (the "stakeholders")

When this first stakeholder meeting, or reference group meeting (see below), has taken place the project plan will be updated and finalized as much as possible. We anticipate that the project plan will be a somewhat living document meaning that the content of each project task may change some during the progress but the final objective should still be kept.

Involvement of "stakeholders/reference group"

Already from the beginning of the project it has been clear that several of the funding members wants to be actively involved in the project and it is therefore necessary to invite them as early as possible to give their input/position on what the project should focus on from an industry perspective.

A WebEx meeting will therefore be performed with Swedish and Finnish stakeholders where the draft project plan will be presented and the stakeholders will be asked to give their comments to the plan. Also during this meeting a draft of a questionnaire that will be used for Task 0 – Industry Survey – will be presented and again, the stakeholders will be asked to provide their comments and inputs.

A message has been sent to the stakeholders that the project group suggest this meeting to be held on either May 6, 7 or 20. We have also asked the stakeholders to carefully consider who should participate from their side in such a meeting and during the project itself, i.e. what skills/disciplines do they think is important to have represented from their side in the project.

A9. Status report POOLFIRE

Status of the POOLFIRE project and achievements during period December 2012-May 2013.

The following achievements can be reported between December 2012 and May 2013.

The second year report was delivered at the end of January [1] as an update of the first year report [2]. The report was recently also approved by the management board of the PRISME OECD project [3]. This means that it now can be published in the public domain. A publication was made by Lund University on the simulations performed in the second year report, which was approved for publication in Fire Safety Journal. The publication will be part of the PhD work of Jonathan Wahlqvist, PhD student at Lund University.

During the spring of this year the university of Lund performed a number of fire tests in order to investigate the fire behaviour of di-electrical fluids. Cone calorimeter tests with ISO 5660 and ad hoc tests have performed in order to determine values as input for the modelling of these types of fluids when they burn as pool fires. Both traditional mineral oil as well as esters and silicon oils have been used. A master student from Belgium within the joined Erasmus Mundus programme from Gent, Edinburg and Lund performed the tests and work. The work will be published as master thesis at the end of May. The tests have also lead to cooperation with ESS (European Spallation Source) facility. Although that the poolfire project will not cover all aspects of fire with di-electrical fluids it will show how applicable the models might be even for fluids with high fire point.

The University of Lund now does modelling of the test campaign performed during the summer of 2012 with the new pyrolysis model developed by VTT. Also new tests from the OECD PRISME 2 project will be used for the final validations as well as the real scale fire information from Heysham (England) resulted from the visit by Ringhals and OKG to the facility.

The project is running as planned and no delays occurred.

References

1. Patrick van Hees, Jonathan Wahlqvist, Simo Hostikka[1], Topi Sikanen[1], Bjarne Husted[2], Tommy Magnusson[3], Fredrik Jörud[4], Prediction and validation of pool fire development in enclosures by means of CFD (Poolfire) Report – Year 2, LTH Report 3169, Lund 2013.

2. Patrick van Hees, Jonathan Wahlqvist, Simo Hostikka[1], Topi Sikanen[1], Bjarne Husted[2], Tommy Magnusson[3], Fredrik Jörud[4], Prediction and validation of pool fire development in enclosures by means of CFD (Poolfire) Report – Year 1, LTH Report 3163, Lund 2012.

3. http://www.nea.fr/jointproj/prisme.html (downloaded 2011-12-15)

A10. Status report SADE

Status report for the "Safety culture in design and implementation of technological and organisational solutions - improving resilience of the sociotechnical system throughout the life-cycle" (SADE) NKS_R_2011_97 Project – May 2013

Work status

The main objective of **SADE** project for 2013 is to test and evaluate the results of Phase I and Phase II. The testing and evaluation will be based on in depth analysis of selected design projects as case studies conducted both in Finland and Sweden. By the analysis of the case studies the project will develop a deeper understanding about how the challenges identified in phase I and II manifested from the designers' perspective, as well as about how they were recognised, addressed and overcome.

The following activities were planned for the year 2013:

1. Selection of relevant case studies in Finland and Sweden to be analysed on the basis of the results of phase I and phase II.
2. Interviews and workshops with designers involved in the selected cases to test and validate the relevance of the identified challenges and the model of human and organisational factors affecting the design process.
3. Internal workshops with the research parties were initial findings are discussed, data is analysed and common view is formulated
4. Drawing conclusions and writing the final report of the third phase of the SADE project.

During the first reporting period of 2013 the following activities were performed:

1. Power companies have been contacted in Sweden and Finland to gain access to the case studies. At the present moment, only one Finnish power companied authorised the case study.
2. Three individual interviews and one group interview at the power company has been conducted. A first interview with a STUK representative.
3. The transcription of the interviews and their translation into English is currently in progress
4. Regular monthly meetings have been held within the project team

Potential difficulties and delays

Potential difficulties and/or delays in achieving the project's objectives are:

- Delay in conducting the case studies due to difficulties in gain access and authorisation by the power companies.

Nordisk kernesikkerhedsforskning
Norrœnar kjarnöryggisrannsóknir
Pohjoismainen ydinturvallisuustutkimus
Nordisk kjernesikkerhetsforskning
Nordisk kärnsäkerhetsforskning
Nordic nuclear safety research

NKS-B Status Report

Kasper G. Andersson
NKS-B Programme Manager
May 2013
Technical University of Denmark

Status summary

Overall the work in NKS-B is progressing well. Since the last NKS-B status report was made to the NKS-Board in January 2013, 4 new final reports from completed NKS-B activities have been published on the NKS website. All of the delayed NKS-B activities that commenced prior to 2012 are completed. Of the 9 NKS-B activities commencing in 2012, 5 have been completed, 1 is very near completion, and 3 are delayed. Of the NKS-B activities that started in 2013, contracts have been agreed and signed with all. Activities that started in 2013 are all currently on schedule. The contract for the NKS-B activity PONPP2, for which funding was allocated in 2011, has never been signed, and a final attempt to start the activity has failed.

NKS-B reports

The following NKS-B reports have been published on the NKS website since the last NKS-Board meeting.

Gamma Workshops
E. Strålberg et al.
GammaWorkshops 2012 Proceedings

MOMS
J. Nilssen et al.
Mobile Measurement Systems, Final Report from NKS-B MOMS

BERMUDA
T. Turtiainen et al.
Doses from natural radioactivity in wild mushrooms and berries to the Nordic population. Interim Report from the NKS-B BERMUDA activity

COSEMA
M. Iosjpe et al.
Consequences of severe radioactive releases to Nordic Marine environment

NKS-B activities from 2011 (January)

PONPP2

Preparedness Organization at Nuclear Power Plants in the Nordic countries
Activity Leader: Jan Porsmyr (IFE-Halden)

NKS-B funding: **300 kDKK**

Contract not signed.

Status
Some of the participants have not been able to commit the required resources, and the activity leader organisation has therefore, after several attempts to get starting, recommended that the activity be cancelled and proposed that the 300 kDKK be transferred to the NKS reserve.

NKS-B activities from 2012 (January)

Nordex12

Nordic Exercises 2012
Activity leader: Sigurdur Emil Pálsson

NKS-B funding: **420 kDKK**

Milestones defined in contract:
1. Development of revised work plan in consultation with the participating Nordic Authorities (March 2012)
2. Presentation at a meeting of Nordic Authorities of NordEx12 support for Nordic participation in the Swedish REFOX exercise (March 2012)
3. Meeting for representatives from Nordic Authorities with planners of REFOX (May 2012)
4. Coordination with NKS-B MOMS of Nordic technical preparation for REFOX (e.g. harmonisation of data formats and processing, to the degree needed) (at MOMS seminar, May 2012)
5. Development and distribution of scenarios for table-top exercises for use by the authorities individually (May 2012)
6. Coordination of Nordic participation during the REFOX exercise (September 2012)
7. Progress report (including summaries of shared experience of exercises, December 2012)
8. Seminar on lessons learned after REFOX and related exercises (spring 2013)
9. Final report (May 2013)

Status
Contract signed. The seminar has not yet been held, but time and venue have been defined. It will take place, in conjunction with the EmSem seminar, on 27-29 August 2013, at Hotel Park Inn, Solna Centrum, Stockholm, Sweden. The seminar will thus address both the findings from the REFOX exercise and those from other recent exercises. Final report expected in September.

MUD

Meteorological uncertainty of atmospheric dispersion model results
Activity leader: Jan Havskov Sørensen (DMI)

NKS-B funding: **300 kDKK**

Milestones defined in contract:
1. Kick-off meeting (DMI, Met.no, Risø, SSM, DEMA)
2. Case studies selected (DMI, Met.no, Risø, SSM, DEMA)
3. Corresponding NWP model ensembles generated (DMI, Met.no)
4. Long-range atmospheric dispersion models applied to the case studies, and atmospheric dispersion model ensembles generated (DMI, Met.no)
5. Status meeting (DMI, Met.no, Risø, SSM, DEMA)
6. Preparation of NKS-B application for project continuation and completion next year (DMI, Met.no, Risø, SSM, DEMA)

Status
Contract signed. Final reporting seems imminent. A good 32 p. long draft has been received, and only minor dosimetric work is missing.

THYROID
Assessment of accidental uptake of radioiodine in emergency situations - proficiency test and evaluation of the regional capabilities
Activity leader: Lilián del Risco Norrlid (SSM)

NKS-B funding: **280 kDKK**

Milestones defined in contract:
1. First call for activity
2. Running the calibrations and intercomparison exercise
3. Meeting of coordinators for evaluation of the results
4. Report of the activity

Status
Contract signed. The activity started in the autumn of 2012, when calibration sources were received from Russia with great delay. Calibration sources are now being circulated for use by 30 registered participants. A revised deadline for submission of the final report was agreed in the autumn of 2012 (30 October 2013). The activity leader will write a scientific paper on the activity work, which she originally in the autumn of 2012 planned to send for peer review by 15 December 2013. Currently, it looks like there will be a further delay of the above deadlines by 3-4 weeks.

PUBPLUME
Communicating dispersion modelling results to the public
Activity leader: Jan Erik Dyve (NRPA)

NKS-B funding: **150 kDKK**

Milestones defined in contract:
1. Workshop with follow-up meeting
2. Final report

Status
Contract signed. The activity started in 2012, and videoconferences were held for coordination of the individual national efforts for the final report. Minutes have been received. Due to heavy work load up to a big NB8 on 14 March 2013, the final report has been delayed, and will most likely not be available yet for the NKS Board meeting in May 2013.

NKS-B activities from 2013 (January)

EmSem
Seminar – Practical and operational emergency preparedness – Status and future developments
Activity leader: Sigurdur Emil Pálsson

NKS-B funding: **210 kDKK**

Milestones defined in contract:
1. Initial announcement of seminar (April 2013)

2. Announcement of registration procedures (May 2013)
3. Seminar held (August 2013)
4. Final report submitted (December 2013)

Status
Contract signed. Progress on schedule. The seminar was announced in April 2013. It will take place, in conjunction with the Nordex12 seminar, on 27-29 August 2013, at Hotel Park Inn, Solna Centrum, Stockholm, Sweden. The seminar will thus address both the findings from the REFOX exercise and those from other recent exercises.

MUD (continued)
Meteorological uncertainty of atmospheric dispersion model results
Activity leader: Jan Havskov Sørensen (DMI)

NKS-B funding: **360 kDKK**

Milestones defined in contract:
1. Project meeting (video conference) (DMI, Met.no, DTU, SSM, DEMA)
2. Literature study on ensemble prediction for atmospheric dispersion finalized (DMI, Met.no)
3. Methods developed and described for computation of the meteorological uncertainty of the atmospheric dispersion of radioactivity from accidental releases (DMI, Met.no, DTU, SSM, DEMA)
4. Methods applied to the atmospheric dispersion model ensembles corresponding to the case studies (DMI, Met.no)
5. Presentation of the uncertainties to decision makers described and applied to the case studies selected (DMI, Met.no, DTU, SSM, DEMA)
6. Final project meeting (DMI, Met.no, DTU, SSM, DEMA)
7. Automatic interaction with DSSs described and results made available to ARGOS for demonstration purposes (DMI)
8. Final report (DMI, Met.no, DTU, SSM, DEMA)

Status
Contract signed. Progress on schedule. Kick-off video meeting held on the 9th of April, to agree on who does what and when. Minutes received.

COSEMA (continued)
Consequences of severe raddioactive releases to Nordic marine environment
Activity leader: Vesa Suolanen (VTT)

NKS-B funding: **500 kDKK**

Milestones defined in contract:
1. Draft report of the activity by the end of November 2013.
2. Final report on validated consequences of severe radioactive releases to Nordic marine environment by the end of December 2013.

Status
Contract signed. Progress on schedule. Kick-off meeting held on the 23-24th of April at Risø, to agree on distribution of tasks.

RADIOANALYSIS
Workshop on radioanalysis of radionuclides difficult to measure
Activity leader: Xiaolin Hou (DTU)

NKS-B funding: **370 kDKK**

Milestones defined in contract:
1. Initial meeting / communication for planning workshop, Feb. 2013
2. Announcement of the workshop, Feb. 2013
3. Preparation of workshop March-August 2013
4. Workshop, August 2013
5. Proceedings of workshop lectures and presentation
6. Final report of the project (December 2013)

Status
Contract signed. Progress on schedule. The seminar was announced in April. It will take place on 2-6 September 2013, in Roskilde, Denmark.

BERMUDA (continued)
Doses from natural radioactivity in wild mushrooms and berries to the Nordic population
Activity leader: Tuukka Turtiainen (STUK)

NKS-B funding: **380 kDKK**

Milestones defined in contract:
1. Analytical work at laboratories (spring 2013)
2. Writing of final report (spring 2013)
3. Submitting a scientific article (summer 2013)
4. Final report (summer 2013)

Status
Contract signed. Although the activity is in progress, the partners have not been able to analyse all samples by the contractual deadline. There will thus be a delay in the delivery of the final report (also due to summer holidays). The revised deadline is the 31st of October 2013.

GAMMATEST 2013
Gamma measurement intercomparison and seminar
Activity leader: Henrik Ramebäck (FOI)

NKS-B funding: **370 kDKK**

Milestones defined in contract:
1. Planning meeting (February 2013)
2. Announcement of intercomparison (March 2013)
3. Distribution of data and announcement of seminar (May 2013)
4. Seminar (September 2013)
5. Final report (December 2013)

Status
Contract signed. Progress on schedule. Seminar and intercomparison announced in April. Seminar to be held on 17-19 September, 2013, at FOI, Umeå, Sweden

NOVE
Novel neutron detection methods for nuclear security
Activity leader: Kari Peräjärvi (STUK)

NKS-B funding: **225 kDKK**

Milestones defined in contract:

1. Preliminary local testing (e.g., measurements using different techniques and operational scenarios)
2. Seminar at the Icelandic Radiation Safety Authority: 'Neutron detection in Nordic countries at present and in the future' (funded parties will give an overview on their operational neutron detection capabilities and present results from the preliminary measurements).
3. Neutron intercomparison measurements at the Metrology laboratory of the Finnish Radiation and Nuclear Safety Authority using well characterised Cf-252 and Am/Be sources.
4. Report describing all parts of the activity, including the intercomparison measurements and conclusions. The report will discuss the advantages of each tested technique and their implications for operative use (to be delivered by December, 2013).

Status
Contract signed. The seminar was announced in April, and held 13-16 May in Iceland. Preliminary conclusions are that measurements have been conducted to test various in situ methods under different environmental conditions. The measurement exercise seems to have given interesting results. This was followed by a two-day seminar discussing neutron detection methods and capabilities. Also representatives from Norwegian, Finnish and Swedish authority organisations were present.

Short summary of the NKS Seminar on the Fukushima Accident and Perspectives for Nordic Reactor Safety and Emergency Preparedness, Stockholm, Sweden, 8-9 January 2013

The objective of the seminar was to give an overview of the Fukushima accident, with emphasis on issues of relevance to the Nordic countries. A total of 26 presentations were given, and the seminar had 140 participants.

The seminar was initiated with a suite of four key speakers (Vice Chair of ICRP Abel González, Chair of UNSCEAR Wolfgang Weiss, President of ASN André-Claude Lacoste, and General Director of STUK Tero Varjoranta) giving an international overview of various aspects of relevance to the Fukushima accident. One issue that was highlighted in this opening session was the cause of the accident. It was pointed out that a major factor governing the extent of the disaster was a problematic mindset of assumptions, methods and notations held by those responsible for the safety of the plant[1]. Also, responding effectively to any accident requires good monitoring strategies. In this connection the problem was pinpointed that there is a lack of updated international recommendations on environmental monitoring policy following a large accidental release of radioactive materials to the environment. In the Fukushima case, much effort has been spent measuring quantities (e.g., specific contamination in an unspecified topsoil layer), which were far from optimal seen from an operational angle. Also international information exchange could be improved much. It was stressed that it is the ethical duty of the international community to learn from such lessons and resolve their challenges to avoid repetition.

The following session primarily reviewed the Nordic response to the accident, and important learning points included that an accident in a distant country can be very resource demanding, and that prioritization of limited resources and extensive collaboration between countries is important. Also, it became apparent that decisions and recommendations made by authorities in different countries affect each other. A specific issue that was discussed was the discrepancy in the recommendations of authorities in different Nordic countries regarding iodine prophylaxis for citizens in affected areas. Anyway, tablets were rather rapidly made available for potential use by Nordic citizens in Japan, due to efficient Nordic collaboration in the supplying process. Also the use of countermeasures in the contaminated areas was discussed, stressing needs for familiarization with existing decision support tools well in advance of their use.

The next session focused on the implications for nuclear safety, and an overview was given of the changes in Europe in this context following the Fukushima accident. Then followed overviews of the developments in the two Nordic nuclear power producing countries – Finland and Sweden – given by both authority and utility representatives. Although no immediate needs have been identified for plant changes, extensive studies are being carried out, and it has among other things been proposed to look at flooding and earthquake resistance.

In the session that followed, further lessons were extracted from the events, and for instance the needs for better information strategies and exercises to test preparedness were mentioned. With a view towards possible future contaminating events, it was discussed if operational capabilities in the Nordic countries are sufficient, e.g., with respect to expertise and monitoring equipment.

The final session focused on the future for Nordic nuclear safety and emergency preparedness, asking which improvements might be relevant. Viewpoints of the NEP Group (Nordic work group on Emergency Preparedness) were presented, and on the nuclear safety side, for example a need for common understanding of safety evaluation and associated research was expressed. It was concluded that Nordic communication with the public needs strengthening.

It is hoped that the outcome of the seminar can be further developed into proposals for future NKS work and follow-up on relevant issues in reactor safety and emergency preparedness.

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1 See The National Diet of Japan: The official report of The Fukushima Accident Independent Investigation Commission – Executive Summary (2012) http://www.cjwalsh.ie/wp-content/uploads/2012/07/Fukushima-NAIIC-Executive-SummaryEnglish_2012.pdf

NKS Fukushima Seminar 2013 Survey

Report based on the answers following the questionnaire sent 25 January with follow-up reminder 11 February

Finn Physant
NKS Coordination Group

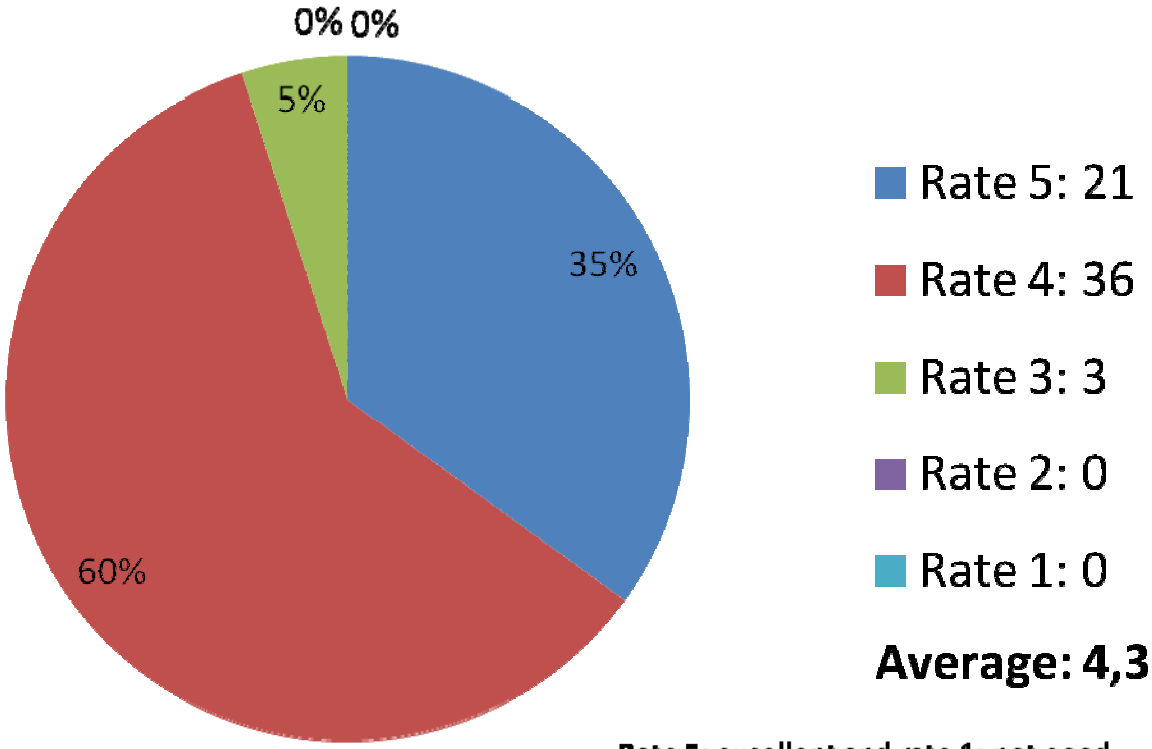
NKS Board meeting
Copenhagen 28 May 2013

NKS Fukushima Seminar 2013 - Survey

- The questionnaire was sent to all 158 registered participants
- Maximum number of possible responses was 136, as 140 attended the seminar and the 4 coordination group members were not expected to answer
- We received 60 responses – meaning a response percentage of 44

NKS Fukushima Seminar 2013 - Survey

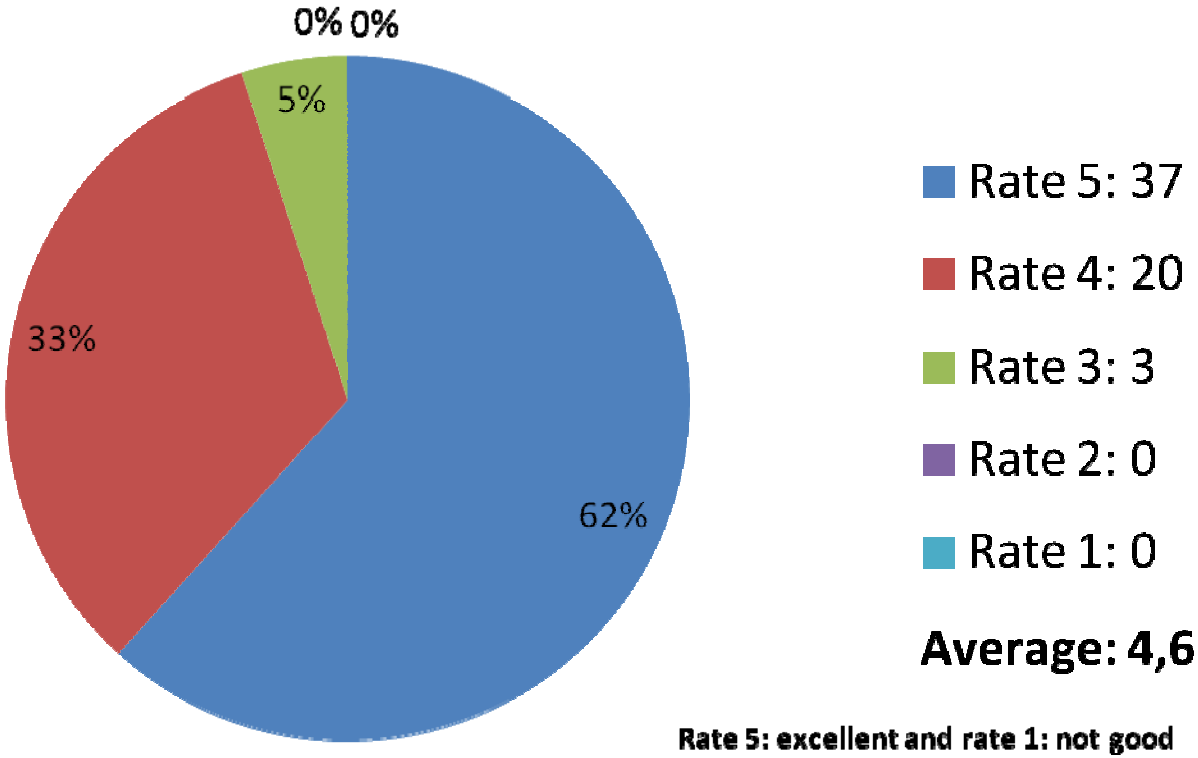
Overall rate of the seminar – 60 responses



Rate 5: excellent and rate 1: not good

NKS Fukushima Seminar 2013 - Survey

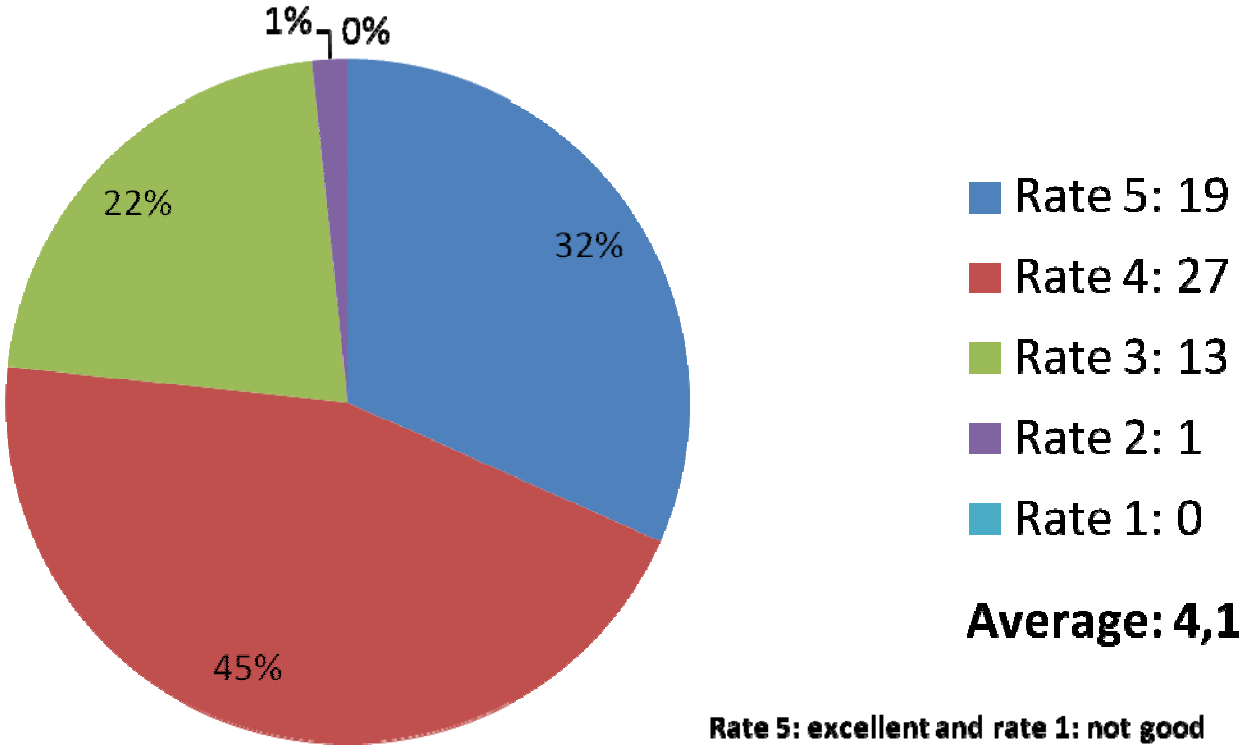
Relevance of the seminar topic



Rate 5: excellent and rate 1: not good

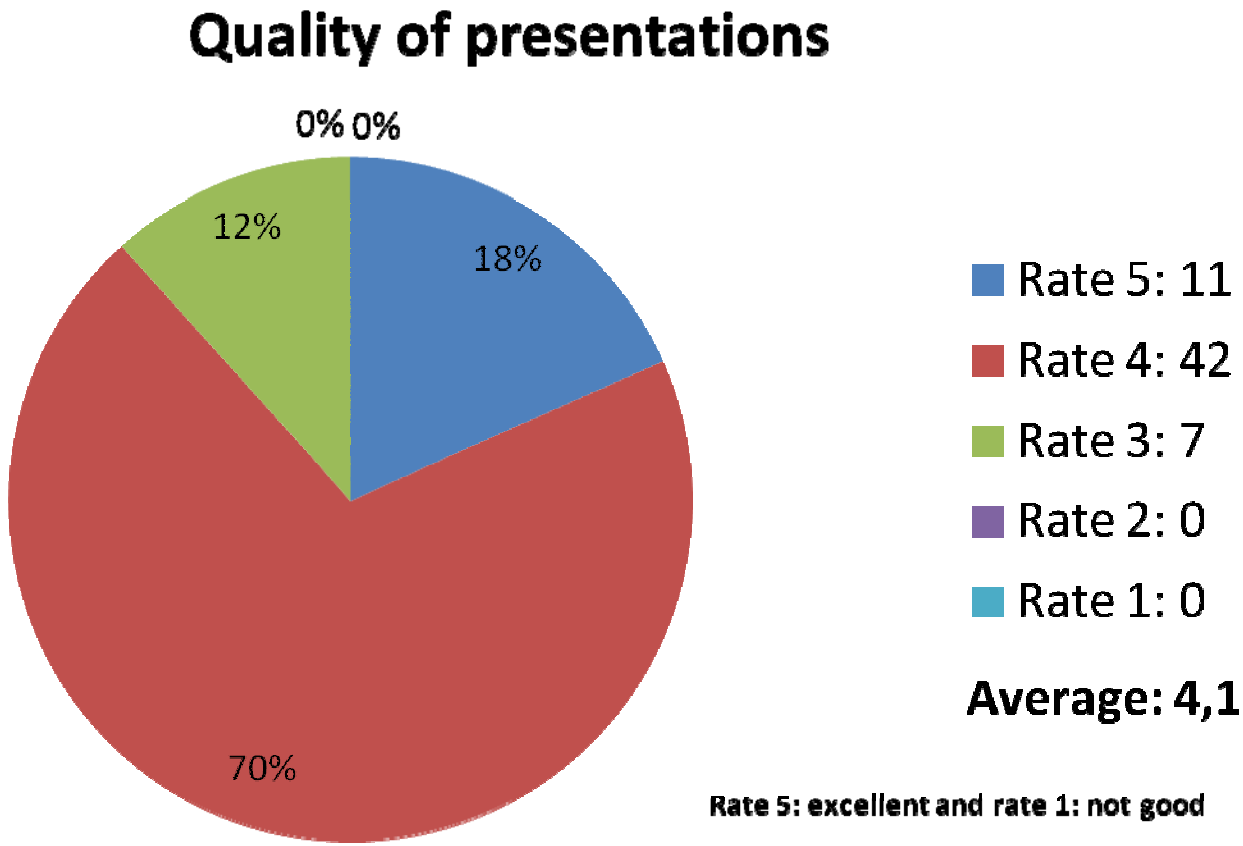
NKS Fukushima Seminar 2013 - Survey

Usefulness of information presented



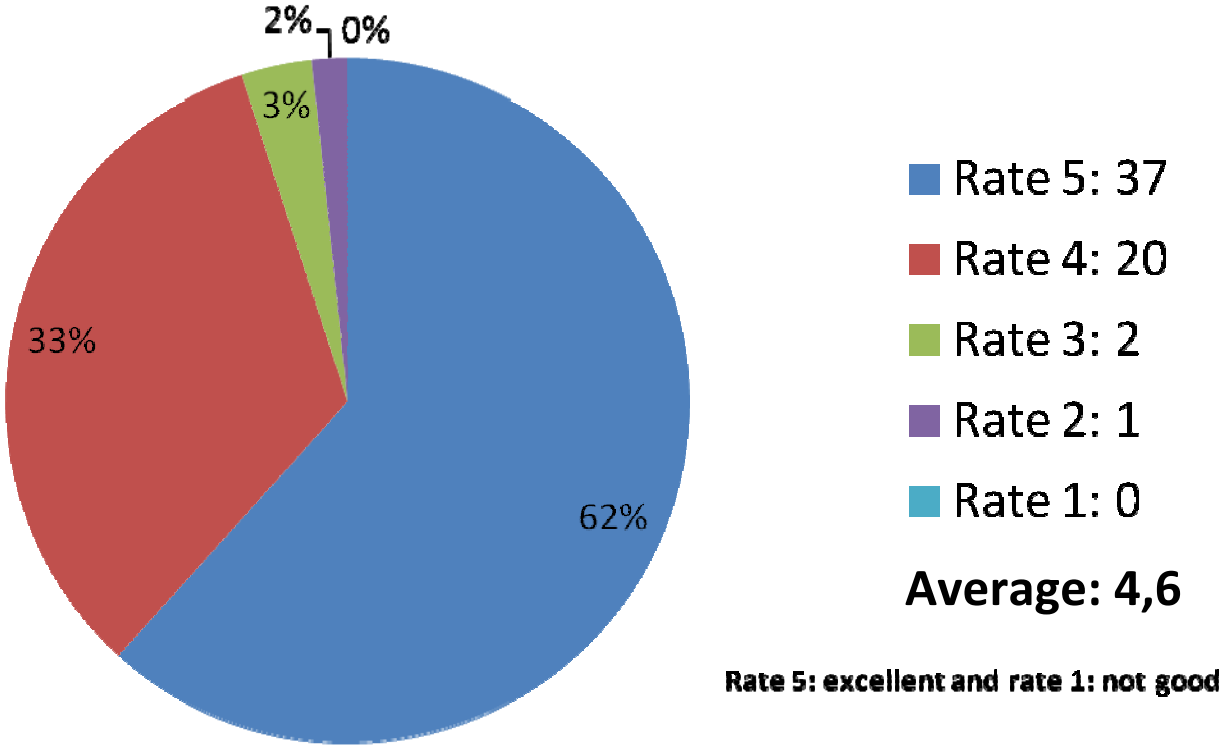
Rate 5: excellent and rate 1: not good

NKS Fukushima Seminar 2013 - Survey



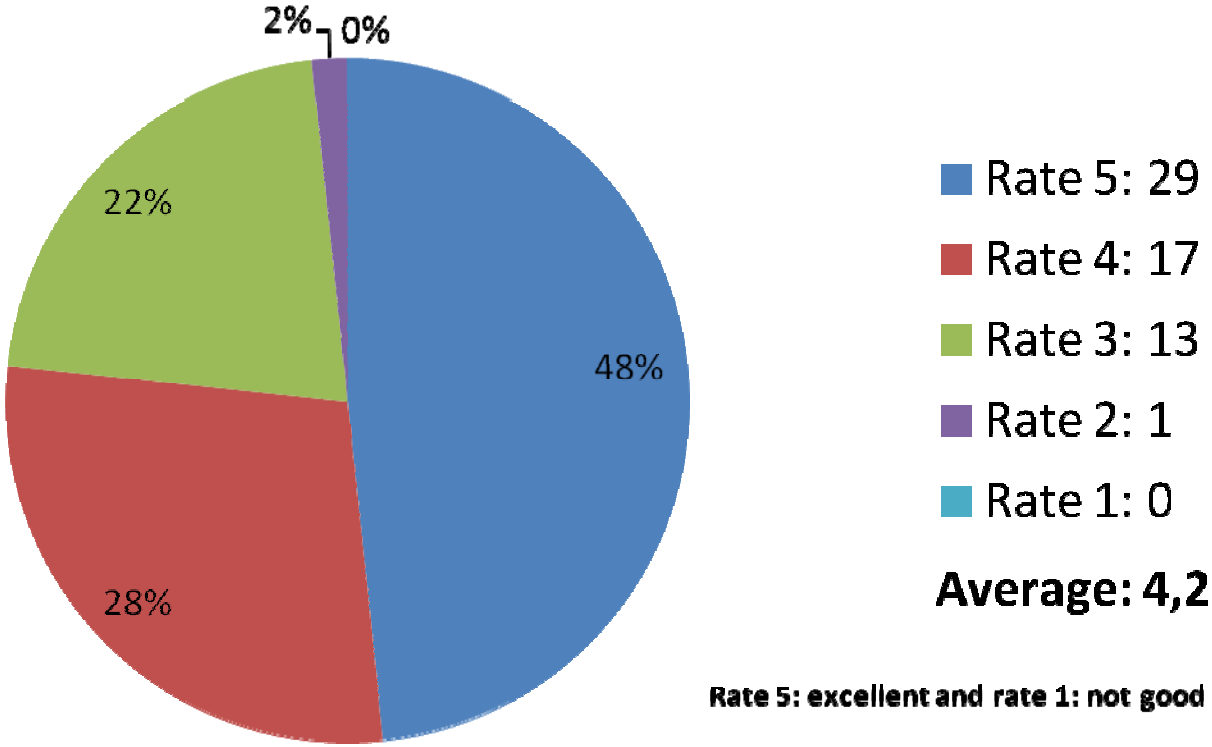
NKS Fukushima Seminar 2013 - Survey

Seminar organization: scheduling and timing



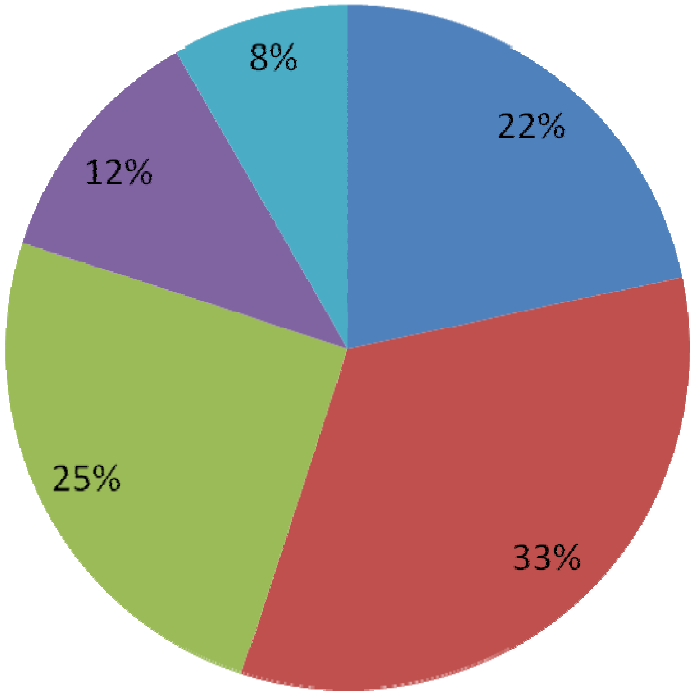
NKS Fukushima Seminar 2013 - Survey

Seminar organization: facility / venue



NKS Fukushima Seminar 2013 - Survey

Seminar organization: handouts during the seminar



Rate 5: 13

Rate 4: 20

Rate 3: 15

Rate 2: 7

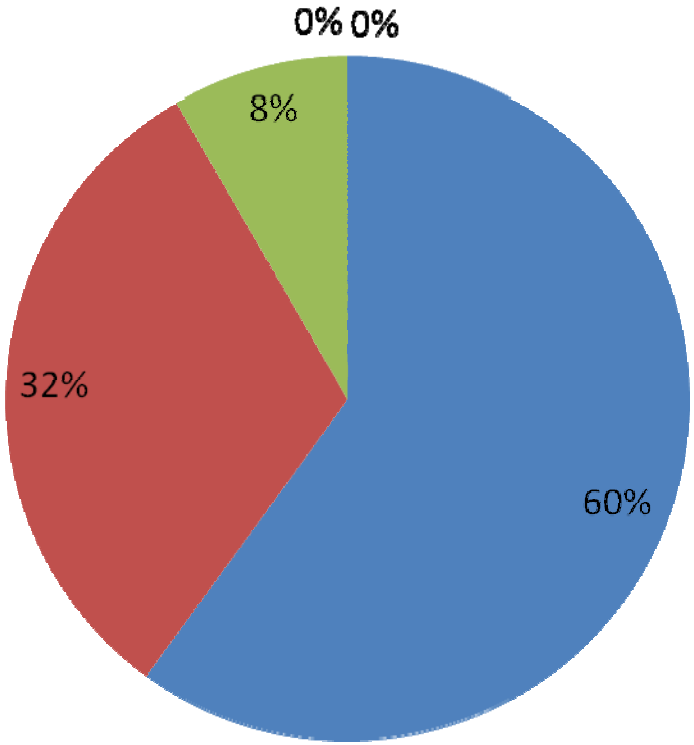
Rate 1: 5

Average: 3,5

Rate 5: excellent and rate 1: not good

NKS Fukushima Seminar 2013 - Survey

How likely are you to attend future NKS seminars



Rate 5: 36

Rate 4: 19

Rate 3: 5

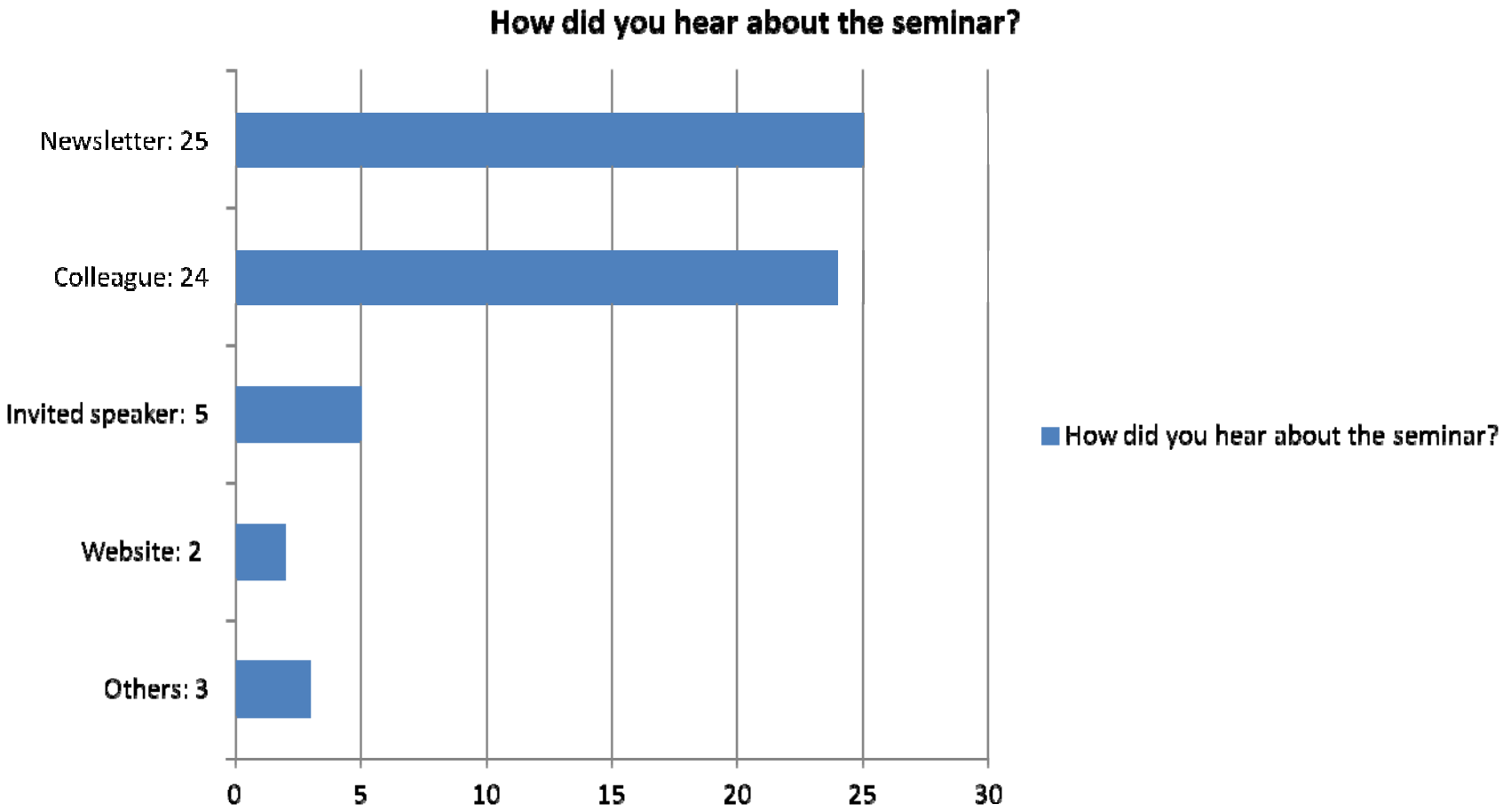
Rate 2: 0

Rate 1: 0

Average: 4,5

Rate 5: very likely and rate 1: not likely

NKS Fukushima Seminar 2013 - Survey



NKS Fukushima Seminar 2013 - Survey

- Provide more time for questions, please. What happened to the video recording? It would be nice to have this available. Thank you. (T)
- More time for discussion had been good, between the presentations. (T)
- On day 2, some more discussion time would have been good, and in particular a final questions and discussion session (preferably 30 minutes but even 15 minutes would have been very good). (T)

NKS Fukushima Seminar 2013 - Survey

- Time keeping should be improved. Speakers should not be allowed to speak overtime, and enough time should be allocated for discussions in the agenda. (T)
- The sessions were quite heavy with several 2 hours sessions with 30 min long presentations. Specially the 30 min long presentations seemed too heavy (20 min would have been enough for most). I was hoping for more presentations on what is going to be done at Swedish NPPs as Fukushima actions. It was a bit disappointing that this side was not covered so much (I understand that it must have been difficult to contact companies on this topic, and the companies are not so open on this topic at this time when the plans are not totally fixed. But anyhow excellent seminar, thank you very much! (T)

NKS Fukushima Seminar 2013 - Survey

- Perhaps fewer and a bit longer presentations? (T)
- More time should be reserved for questions. Max length of presentations (30 min + 15 min for questions/discussion). (T)
- Website with presentations could be made available already during the seminar. (T)
- Everybody should use a microphone, always! (S)
- Some minor problem with microphones and peoples willingness to use them. (S)

NKS Fukushima Seminar 2013 - Survey

- A few commentators gave surprisingly superficial answers. (V)
- There should have been something about the consequences outside the fence. We know from Tjernobyl that such consequences may be large and also require R&D in advance. (V)
- Naturally, the Seminar was too Nordic-oriented. Given the internationalization of nuclear safety, perhaps NKS could consider a better balance of Nordic vis-à-vis global interests. (V)

NKS Fukushima Seminar 2013 - Survey

- I think the bridging between R and B was fine. Maybe a little too much on Stress test? In general good presentations. The queing in breakes etc should have been avoided. Ok reception in the afternoon. (V)
- We will provide a proposal concerning a matter that is missing in NKS' list of issues, namely the risk of poorly performing repositories for disposal of radioactive waste. (V)
- It was an excellent seminar. I would love to join again next time. Thanks for organizing such a good seminar. (V)

NKS Fukushima Seminar 2013 - Survey

Conclusion from the survey – some lessons learned:

- Handouts must be improved – we should consider the logistics in connection with the seminar opening.
- We should make even more intensive use of newsletters before the registration deadline and the seminar itself.
- We should consider more time in the seminar program for questions and discussions.

Short note on status of the website, NewsLetters etc.

Website
The new ODEUM website was opened in May 2012 and has so far proven very flexible and user friendly. Besides handling many everyday tasks, the website turned out to be a helpful tool for carrying out the Fukushima Seminar – for instance for registration of the participants, for our communication with the participants, for presentations, for carrying out a survey and – as something completely new - for video presentations.

As earlier statistics - collected from the old website - were discontinued, we started obtaining data from a Google site starting November 2012. Here you have some main monthly figures:

	Dec. 2012:	Jan. 2013:	Feb. 2013:	Mar. 2013:	Apr. 2013:
Visitors:	771	2.110	841	727	1.030
Unique visitors:	562	1.342	642	550	718
New visitors:	536	1.226	539	474	584
Returning visitors:	235	884	302	253	446

This statistics reporting will be continued.

NewsLetters and NewsFlashes
Since the last board meeting four NewsFlashes have been distributed. The first one of January 15 was a summary report from the January board meeting including the board's grant decisions for 2013, and the second of January 24 made the seminar presentations public. The third one of April 4 presented NKS on social media, upcoming seminars and new publications and the fourth of April 19 made the video presentations public. Besides this a NewsLetter is under preparation for distribution before the board meeting May 2013.

There is now a list of more than 450 e-mail addresses, to which our electronic letters are forwarded. This number has increased by more than 50 since the January board meeting.

The Secretariat
Finn Physant
15-05-2013

The NKS Programmes for Nordic cooperation on nuclear and radiological safety

Kasper G. Andersson[1,2], Kaisu Leino[1,3], Sigurður M. Magnússon[1,4] & Finn Physant[1,5]

[1] NKS, Roskilde, Denmark
[2] DTU Nutech, Roskilde, Denmark
[3] Fortum Power and Heat Oy, Espoo, Finland
[4] Icelandic Radiation Safety Authority, Reykjavik, Iceland
[5] FRIT, Roskilde, Denmark

This is the first of three articles covering NKS and NKS activities. The second article to be published in the next issue of Radiation Regulator will focus on NKS activities in nuclear safety while the third article will focus on NKS activities in emergency preparedness.

Abstract

NKS is a platform for Nordic cooperation and competence maintenance in nuclear and radiological safety, including emergency preparedness. It is an informal forum serving as an umbrella for Nordic initiatives and interests. It runs joint activities of interest to financing organisations and other end-users.

Retrospective introduction

Nordic cooperation on issues related to nuclear and radiological safety dates back to the 1950's where the industrial potential of atomic energy first attracted Nordic governments, as this novel source of energy production was foreseen to be inexpensive and constitute virtually unlimited resources. In 1952, the Nordic Council was created with the purpose of reconstructing inter-Nordic ties after the Second World War, and although preparatory development in relation to nuclear power production was rather inhomogeneous among the different Nordic countries, a Nordic committee, the 'Kontaktorgan', was established in 1957 with a mandate to follow the further planning of nuclear power development in the Nordic area. This committee had a specific objective to promote initiatives between the Nordic countries to join forces in the further development.

In the early years, a major discussion issue dealt with in the 'Kontaktorgan' was the provision of the required nuclear materials, and soon both Nordic ministry representatives and scientists were deeply involved in the work of the committee. By 1977, a source of finance of cooperative research projects had emerged through the Nordic Council of Ministers, which had been established six years earlier as a complement to the Nordic Council. On this background, NKS (acronym for 'Nordisk KerneSikkerhedsforskning', or in English 'Nordic Nuclear Safety Research') was created, and over the decades that followed, this organisation has run a large number of research activity programmes. Initially these focused on the safety issues of nuclear power plant operation and waste management, but following the Three Mile Island accident in 1979 and the Chernobyl accident in 1986, the focus to some extent shifted to emergency management and prevention of accidents. Both components

remain main fields of work for today's NKS, although developments in Nordic societies have since then added a series of new focus areas, including NORM (naturally occurring radioactive materials) waste management and security and response in relation to potential malicious uses of radioactive substances.

Today, after numerous administrative changes and research programme models, NKS is owned jointly by national competent authorities, and receives additional financial support from a number of Nordic co-sponsor organisations.

Objectives and work areas

Owing to intertwined cultural history, geographical neighbourhood, similarities in language, environment and societal challenges, and a wish to gain through cooperation with equal partners, it seems natural for the Nordic countries to seek cross-border cooperation with each other. A requirement to realise the full potential of this scheme in the present context is a common view on nuclear and radiological safety including emergency preparedness. This, in turn, demands a common understanding of rules, practice and measures, which can vary between countries as well as with time. It is a main objective of NKS to facilitate the common Nordic view that keeps the relevant bonds viable between the Nordic countries.

Nordic authorities, nuclear power companies, scientists and various other stakeholders continuously keep in contact through the informal networks that NKS offers. This enables sharing of resources whereby the potential for responding to urgent issues is enhanced for the entire region. Problems can generally be tackled quicker, more efficiently, more consistently and at a lower cost through collaboration, bearing in mind that key competences are not equally distributed in the different Nordic countries.

On a more detailed level, there are for instance common Nordic challenges in relation to nuclear installations, where nuclear power plants are in operation in Finland and Sweden, and research reactors have been operated in Denmark, Finland, Norway and Sweden. There is an obvious benefit in exchanging ideas and technologies in relation to plant operation, and since a number of reactors in different Nordic countries are under decommissioning, a collaborative benefit can also be realised in that context. Sweden also has a nuclear fuel production plant, and its collaboration with other Nordic nuclear installations can also be beneficial. Further, a number of large radiological installations are projected in Nordic areas (e.g., the MAX-LAB/MAX IV synchrotron radiation source and the European spallation source ESS), where Nordic organisations are collaborating in addressing, e.g., potential environmental implications.

On the emergency preparedness side, the Fukushima accident in March 2011 was a reminder that large accidents at nuclear installations can lead to wide dispersion of radionuclides in the environment. In order to respond to nuclear or radiological emergencies, should they affect Nordic populations, it is necessary to maintain an operational emergency preparedness. By continuously improving detection, response and decision aiding tools while maintaining an informal collaborative network between relevant stakeholders in the Nordic countries (including nuclear power plant

experts), the capacity and capability to respond optimally to an emergency is enhanced. Today's emergency preparedness also needs to address prevention against and response to nuclear and radiological terror attacks.

NKS activities have the aims of improving Nordic nuclear and radiological safety, including emergency preparedness, maintaining informal cooperation networks between Nordic countries, disseminating information, and increasing competence in relevant fields. Ensuring required expertise for the future is a priority task, which NKS addresses by promoting involvement of students and young scientists in all its activities.

It needs to be stressed that NKS warmly encourages Nordic participation in parallel collaboration on other organisational (e.g., European) levels, which has resulted in many important products that have been adapted into the current Nordic nuclear and radiological safety plans.

Organisational structure

The joint owners and main financiers of NKS are the Danish Emergency Management Agency, the Finnish Ministry of Employment and the Economy, the Icelandic Radiation Safety Authority, the Norwegian Radiation Protection Authority, and the Swedish Radiation Safety Authority. Current co-financiers are Fennovoima Oy (Finland), Fortum Power and Heat Ltd. (Finland), TVO (Finland), Institute for Energy Technology (IFE; Norway), Forsmark Kraftgrupp AB (Sweden), Nuclear and Training and Safety Centre AB (KSU; Sweden), OKG AB (Sweden) and Ringhals AB (Sweden).

There are two scientific / technological programmes.

The NKS-R programme, which deals with

- reactor physics and safety,
- nuclear power plant life management and extension,
- decommissioning and handling of generated waste,
- organisational issues.

The NKS-B programme, which deals with

- nuclear and radiological emergency preparedness,
- measurement strategy, technology and quality assurance
- radioecology and environmental assessments,
- management of radioactive waste and discharges.

NKS activities

The two programmes are continuously renewed through an annual call for proposals for new activities, which is open to all relevant Nordic organisations. These activities run for 1 year. The activities may comprise research, investigations, exercises, conferences, seminars, workshops, courses, submission of scientific papers, etc., and it is a requirement that they all deliver a final report, which is published on the NKS

website (www.nks.org). A framework document for each programme is updated prior to each call for proposals, pinpointing general topics of particular relevance at the time. For instance, the importance of rapidly extracting learning points from the Fukushima accident experience was stressed. Owing to the flexibility of the organisation, a series of NKS activities had been launched within months of the accident, testing and evaluating parameter sensitivity in emergency preparedness models describing dispersion and migration of radionuclides in the air as well as in oceans, evaluating various emergency measurement systems and their capacities, and describing new means and strategies for communication between experts and the public. A series of final reports from these activities are now available on the NKS website, where all is free of cost. Although results are expressed with a view to Nordic conditions, NKS activity results often have relevance far beyond the Nordic communities.

The budget for the latest annual call (in October 2012) for activity proposals under the two programmes was nearly 1 million €. In addition to the funding provided directly by NKS for the activities, matching in-kind contributions are supplied by the organisations that participate in the activities, without which it would not be possible to run these NKS activity programmes.

Other types of activities are arranged and executed by the organisation itself from time to time. Joint NKS-R and NKS-B seminars have been arranged at intervals of a few years, and in January 2013, a topical seminar was held in Stockholm, dealing with the Fukushima accident and its perspectives for Nordic reactor safety and emergency preparedness. Here a total of 26 presentations were given to an audience of 140 participants (presentations are available at http://nks.org/en/seminars/presentations/nks_fukushima_seminar.htm). International perspectives were covered by Abel González (Vice Chair of ICRP), Wolfgang Weiss (Chair of UNSCEAR), André-Claude Lacoste (President of ASN), and Tero Varjoranta (General Director of STUK). Among many other things, the presentations given over the two seminar days demonstrated that even a nuclear accident that occurs so far away that it has no radiological implications for Nordic areas can be very resource demanding for the competent Nordic authorities and experts, and decisions taken in remote areas may influence conditions in countries where the radiological impact is not trivial. Also differences between Nordic national recommendations for citizens in contaminated areas were highlighted and discussed. Altogether, many lessons could be drawn with respect to management of emergencies, some of which related to the specific Nordic preparedness systems, whereas others were of a more generic nature (e.g., that releases from nuclear power plants are not necessarily discrete events). Scope was identified for even closer collaboration between Nordic countries in the emergency preparedness area. It was also clarified which implications the accident has so far had for nuclear power plant operation in the different Nordic countries, and which future measures can be expected. Many of the useful new ideas that emerged during the seminar could, and hopefully will, be transformed into research applications for the next call for NKS activity proposals in the autumn.

André-Claude Lacoste giving his presentation at the NKS Fukushima seminar in Stockholm (Photo: Manne Kjellander, MAURI FILM).

Conclusions

The NKS organisation has existed since 1977 and has run hundreds of research activities in fields comprising reactor safety, decommissioning, nuclear and radiological emergency preparedness, and management of radioactive waste. It has over many years provided a forum for Nordic cooperation and networking, while developing advanced technologies and methods that have been used both inside and outside the Nordic areas.

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