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S.J. Savage

Final report:

Preparations for the Swedish Defence Nanotechnology Programme

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Final report: Preparations for the Swedish Defence Nanotechnology Programme

Abstract (not more than 200 words)

This report documents the planning and preparations prior to the start of the Swedish Defence Nanotechnology Programme in October 2003. It contains all the meeting minutes, lists of initial project ideas, project applications and a short description of the planning process in Swedish and English.

Keywords

planning, final report, nanotechnology programme

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Rapportens titel (i översättning)

Slutrapport: planering av det Svenska försvarets nanoteknikprogram

Sammanfattning (högst 200 ord)

Rapporten dokumenterar planeringen och förberedelserna inför starten av Försvarets nanoteknikprogram i oktober 2003. Rapporten innehåller alla mötesanteckningar, listor över preliminära projektidér och inlämnade projektansökningar samt en kortfattade beskrivning av planeringsprocessen på svenska och engelska.

Nyckelord

planering, slutrapport, nanoteknikprogram

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INTRODUCTION

This report is prepared to document the preparations which led to the submission of a proposal for a special programme of nanotechnology in defence applications.

The report contains three major parts:

1. The notes and minutes from all the meetings which took place prior to submission of the programme to Defence Headquarters in May 2003.
2. A list of all the project ideas and proposals which were received by the working group responsible for planning.
3. A brief description of the entire planning process (in Swedish, extracted from the programme proposal), and a brief description of the planning process (in English, written to be included as part of an initiative by the National Aerospace Institute, Ministry of Defence, Spain)

These are contained in Appendices 1, 2, 3 and 4 respectively.

DISCUSSION

The first documents contained in this summary report are dated March 2001, when FOI was first asked to consider the feasibility of a defence nanotechnology programme. A group from FOI was created, which met informally a few times to discuss the idea and, if this proved to be feasible, how to proceed. The group concluded that the idea was indeed feasible and that nanotechnology showed enough potential to warrant further investigation. Following this a formal working group (AgNano) was created, with representatives from defence headquarters, FMV and FOI. Subsequent events and meetings are documented in Appendix 1.

Appendix 2 contains a list of all the initial ideas received, followed in Appendix 3 by a list of those ideas which were then developed into complete project proposals.

Appendix 4 describes briefly how the planning process was executed, and is a literal extract from the Nanotechnology Programme proposal. Appendix 4 also contains a brief description (in English) of the planning process written in November 2003 at the request of the National Aerospace Institute (INTA) of the Spanish Ministry of Defence. The purpose of this was to describe the Swedish experiences in order to assist INTA in preparing a report on advanced technology to the Spanish MoD.

SUMMARY

Beginning in the early summer of 2001 the idea of launching a special programme directed towards defence applications of nanotechnology was raised. A working group was created, and a process of planning and preparation was initiated, which led to the submission of a programme proposal. This was accepted in its entirety, and on 1 October 2003 the Swedish Defence Nanotechnology was formally started.

APPENDIX 1

APPENDIX 1.1 Meeting notes 2001-03-08

Anteckningar från möte #1+2 angående uppdraget från FM (Rolf Dahlberg) att fundera på hur ett eventuell program inom militär nanoteknik (arbetsnamn) skulle kunna läggas upp.

Närvarande: Sören Svensson, Anders Callenås, Steven Savage

Datum, plats: 2001-03-08, FOI

- Mycket är okänd när det gäller vilkoren och förutsättningar. Dessa anteckningar är mycket preliminära.
- Använd fotonik program som "mall" detta har visat sig fungera bra, och är känd av Dahlberg.
- Nanoteknik programstorleken är okänd, vi gissa ca 10 Mkr/år över 3 år är realistisk.
- Programmet är huvudsakligen inriktade mot det svensk UoH och inhemsk försvarsindustri.
- Ev. andra länder kan vara med som underleverantörer, t.ex Finland (en lista över prioriterade länder finns).
- Ska industri bidra med egna insats?

Förslag till förstudie: aktiviteter, datum

Aktiviteter	Datum
Inledande diskussioner inom FOI	Mars '01
Möte med Dahlberg (SS, AC)	23 mars '01
Utarbetar offert till förstudien	April '01
Beställning av förstudien från FM/FMV	Maj '01
Identifiera potentiella deltagare från UoH, industri, institut	
Varsla om det tänkta nanoteknik programmet, för att deltagarna ska ha möjligheten att fundera på ev. projekt förslag	
Arrangera ett internat, där nanoteknik programmet diskuteras, troligtvis uppdelat i ett antal grupper. Gruppindelning enligt följande schema (nedan). En grov struktur och ev. preliminär referensgrupp finns redan vid internatets start. Vid internatet diskuteras hur de olika förslag kan grupperas. Ev. synergi effekter från SSF och andra forsknings-programmen tas till vara. Ev. utländsk experter inbjuds. Internatet ska välja ut några förslag för vidare arbete	Okt '01
Preliminär offerter/projekt förslag lämnas till referensgruppen	10 jan '02

Värderande respons	Feb. ’02
Definitivt offerter	Mars ’02
Samlade offert till FM/FMV	April ’02
Programstart	Juli ’02

Förslag till indelning av nanoteknik programmet (mycket ofullständig)

Ämnesområde	Funktion	Tillämpning
Bioteknik	Upptäckt samt skydd mot kemiska och biologiska stridsmedel	Kräm (profylaktisk, samt efter exponering)
Sensorer	För upptäckt av kemiska, optiska, akustiska signaler	Små, mark eller UAV-baserade
Informations-lagring	Optiska, magnetiska, mm	Datorer, navigering, kommunikation
Energiförsörj-ning	Sprängämne, drivmedel Elektriska energi lagring (batterier) samt generering (bränsleceller)	Stridsdelar, raketer Sekundär batterier, autonoma sensorer
Flerfunktionell-itet	T.ex. lästbärande signaturmaterial, hälsoindikatorer hos olika strukturer (s.k. intelligenta material och strukturer, mm), självsa nerande textiler	Mark, marin samt luft farkoster
Skydd	Fordon, flyg, kroppsskydd	Baskonstruktion, tilläggsskydd, västar, hjelm

Prioriterade tillämpningsområden (bara militära tillämpningar kan komma i frågan). Ansökningar från forskare/industri nätverk prioriteras.

Verkansformer (graderade verkan, ickedödliga vapen, mm)
Hkp (helikoptrar)
UAV:er
SEP (splitterskyddad enhetsplatformen)
Personskydd (skottvästar, hjälm, övriga personliga utrustningar)

Viktig att inte krocka med SSF, Vetenskapsrådet, mm satsningar

Efter telefonkonferens med Hans Norinder (01-03-15). Spontant tycker Hans att områden som bör prioriteras är de som ligger när i tiden (kan uppvisa snabba resultat). Dessa är troligtvis mest lockande för FM.

Andra områden som verka ”generisk” d.v.s kan bli intressant inom skilda tillämpningar inkludera:

Batterier (elektriska)

Informationslagring
Sensorer

Ett ev. program bör börja bred (2-3 år) och sen fokusera (2-3 år). Helst ser man korta utvecklingstider.

Anders Nilsson intresserade, kanske även på lite längre sikt av nya material i skydd.

APPENDIX 1.2 Meeting notes 2001-05-11

Date 2001-05-11

Present: Anders Callenås (AC) Steven Savage (SJS); Sören Svensson (SS)

We discussed the proposed plan, timetable and activities for the coming few months. Most important is to meet with Hans-Ove Görtz (HOG) and Hans Norinder (HN), to orient them on the plans and to get them involved as soon as possible. SJS is preparing background documentation, to be ready for distribution next week.

We agreed:

- AC to contact HOG, to arrange a meeting as soon as possible. Proposed meeting dates 1 June, 11 June (Linköping) 12 June (a.m., Stockholm).
- HN should create the contact network within FMV and industry
- SJS to contact Anders Blom (flygteknik) and Ola Claesson (NBC) to inform them
- SJS to contact, visit UoH in Sweden to catalogue what they are doing (re nanotechnology)
- Maybe invite one or two professors to give overview lectures
- Build a core working group (active planning) and an associated group (to be kept informed of developments)

One item we didn't discuss was who contacts Michael Jacob. Anders, will you do this please?

Steven

APPENDIX 1.3 Meeting notes 2001-06-11 AgNano meeting #1

FM Nanoteknik initiativ

Mötesanteckningar, Ag Nano möte #1

Datum: 2001-06-11

Plats: Försvarsdepartementet, Sleipner

Närvarande: Hans-Ove Görtz (HOG)
Anders Callanås (AC)
Hans Norinder (HN)
Steven Savage (SJS)

Tid: 13:00 - 15:00

Notes from the meeting

1. Those present introduced themselves, their present roles and professional backgrounds.
2. AC, who called the present meeting, briefly presented the background to the FM nanotechnology initiative, its origins with R. Dahlberg and its relationship to other FoT programmes. At present is seems that the planned FM nanotechnology programme may be financed under ”special programmes,” in a similar way to the on-going ”fotonik” programmme. The latter has been running successfuly for about four years, and can be used as a ”template” with regards to our initial planning, perhaps until the first workshop is completed.
3. Our objective during August - December 2001 is to prepare the background and documentation to be able to arrange a workshop on **nanotechnology in defence applications** during the early part of next year. Provisional date: during March 2002.
4. We agreed to form a working group: Ag Nano, chairman HOG, secretary SJS, other members AC and HN. Further members may be added later. A ”core group” and an ”outer group” was discussed, the core group being the above, an outer group could contain others who should be kept informed, but do not need to be present at all meetings (e.g. others from military headquarters, FMV, FOI and industry).
5. Activities which need to be completed during the period August ‘01 to December ‘01 were discussed. A preliminary plan is attached (Appendix 1).
6. A number of study visits were discussed, and a preliminary list of participants agreed on.
7. Financing: HN has funds to support travel, etc for HOG and HN. These must be used by the end of October. No further funds available from FMV sources before January 2001. SJS has funds for own travel, time, etc, perhaps also for AC (SJS should prepare a budget). AC has some travel funds, it is uncertain if these are sufficient.
8. A critical factor is identification of defence applications for Sweden. The potential is enormous, but funding is not. We must create a list of priorities before the end of the year. Some help in this may be obtained from ”*materielplan i 10-års perspektiv*” which HOG has, and ”*perspektivplan nr 5*,” which AC has. Final priorities will be decided at the workshop next year.
9. HN has an important role in identifying persons at FMV (also industry?) who need nanotechnology in future materiel acquisitions.
10. AC to contact Sören Svensson and Michael Jacob regarding their participation in Ag Nano.

11. AC to see if an extra copy of ”perspektivplan nr 5” is available for SJS.
12. We did not discuss the scale of any future FM nanotechnology programme, but this must be clarified during the autumn. AC to keep the group informed. We assume (until further notice) than any nanotechnology programme can start in January 2003.
13. We discussed writing an popular science article on nanotechnology for Militärteknisk tidskrift. (SJS and HN mainly responsible). This would help to ”advertise” the nanotechnology programme. We should aim to have this published before the workshop in March 2002.
14. We should maintain an awareness of other national (e.g. Vinnova/Vetenskapsrådet) and international (e.g. EU, Nordisk Industrifond) nanotechnology programmes. SJS is responsible.
15. An updated list of contact details of Ag Nano members is attached. Exchange of information by e-post is most effective.

Appendix 1.3.1 Preliminary plan of activites during August - December 2001

Date	Activity	Comments	Participants
August	Study visits to Swedish universities	To orient Ag Nano on Swedish research activities. To be completed by week 35. SJS to arrange dates/places.	SJS, maybe others (all welcome)
3-7 Sept.	Trends in Nanotechnology conference, Segovia, Spain	Programme to be circulated ASAP	SJS, maybe others
11-14 Sept.	Nanomaterials seminar series, Kobe, Japan	Programme to be circulated ASAP. Additional motivation is to improve technology transfer Japan/Sweden	HOG, AC, SJS
20 Sept	Ag Nano meeting: location: Stockholm?	Status report, reports from Spain, Japan conferences	HOG, AC, HN, SJS, maybe others from ”outer group”
1-5 Oct.	Study visit defence labs USA, airforce, army	Need to seek clearance in August at latest. What applications is USA interested in? What can we learn? Information exchange?	HOG, AC, SJS
16 Nov	draft of report circulated to Ag Nano		
22 Nov	Ag Nano meeting: location Stockholm?	To discuss draft rapport	HOG, AC, HN, SJS
6 Dec	Ag Nano meeting: location Stockholm?	Final adjustments to report	HOG, AC, HN, SJS

Appendix 1.3.2 Contact details of Ag Nano members (as of 01-08-15)

Name (avdelning)	Contact details	
Övlt Rolf Dahlberg PLAN B	Försvarets materielverk Banerg. 62 115 88 Stockholm	Tel (dir) 08 782 6245 Mobile Tel (växeln) 08 788 75 00 Fax 08 782 5642 e-post rodah@fmv.se
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Dr Steven J. Savage Inst signaturmaterial Avd sensorteknik	Totalförsvarets forskningsinstitut FOI Olaus Magnus väg Universitetsområde Box 1165 581 11 Linköping	Tel (dir) 013 37 84 31 Mobile 0709 27 73 27 Fax 013 37 85 19 Tel (växeln) 013 37 80 00 e-post steven.savage@foi.se
Foled Michael Jacob IC inst för skydd och material Avd vapen och skydd **Adjungerade**	Totalförsvarets forskningsinstitut FOI Grindsjön 147 25 Tumba	Tel (dir) 08 55 50 41 63 Mobile 0709 27 70 94 Fax 08 55 50 41 80 Tel (växeln) 08 55 50 30 00 e-post michael.jacob@foi.se
Foled Sören Svensson IC inst för signaturmaterial Avd sensorteknik **Adjungerade**	Totalförsvarets forskningsinstitut FOI Olaus Magnus väg Universitetsområde Box 1165 581 11 Linköping	Tel (dir) 013 37 82 56 Mobile Fax 013 37 85 19 Tel (växeln) 013 37 80 00 e-post sorsve@foi.se

APPENDIX 1.4 Meeting notes 2001-08-20

Notes from meeting with Hans Norinder 010820

Agenda (proposed by HN)

- Military applications of nanotechnology
- USA study visit, questions to ask and the itinerary
- The workshop, ideas for

Content of our discussions

- Send information re passport numbers, etc which are needed for HN to apply for clearance. Done
- Due to non-availability of William Mullins, can we postpone the visit two weeks? Check with Anders Callenås (done, he needs to be in Stockholm 16 Oct, but could leave that evening or next day, we could return the following Wednesday)
- Check with Larry Kabacoff
- Can we/should we arrange to meet the Swedish military attaché in Washington? It seems a good idea to establish contact. SJS to find out who this is, and call him. Note, AC also thinks this is a good idea.
- We need to think of some relevant questions to ask of our hosts in the USA, re defence applications of nanotechnology.
- Scale/timeframe of the nanotechnology programme? We suggest 20 Mkr/year for at least 3 years. Minimum finansing is 10 Mkr/year. Start January 2003, maybe earlier if possible.
- How to establish contact with FMV program managers? Via chairmen of the FoT groups. HN to send a short e-mail, SJS to draft a document, send to HN.
- What is needed in 10-15 years?
- How do we identify those systems needed by defence forces in 10-15 years, e.g. micro gliders?
- Are we returning to the old Soviet way of thinking, i.e. large numbers of relatively simple sensor systems?

APPENDIX 1.5 Meeting notes 2001-09-28 AgNano meeting #2

FM Nanoteknik initiativ

Mötesanteckningar, Ag Nano möte #2

Datum: 2001-09-20

Plats: Lidingöv 24, rum 5129

Närvarande: Hans-Ove Görtz (HOG)
Anders Callanås (AC)
Hans Norinder (HN)
Steven Savage (SJS)
Rolf Dahlberg (RD)
Sören Svensson (SS)

Tid: 10:00 - 12:30

Notes from the meeting

1. SS related briefly how the photonics programme was planned, with additional information from RD. Partners in this programme are FOI; industry, FMV, UoH, SSF and Vinnova. Initial emphasis (phase 1) was on material, progressing to components in phase 2. Ultimate aim is a complete system, but the programme will not achieve this in the present framework. Phase 1 contained ca 10 projects (funding 25 Mkr total over 2 years). Phase 2 (continuing) contains ca. 4 projects, (funding 50 Mkr over 3 years). Figures given are the funds from defence organisations, in addition about 150 Mkr is supplied by SSF/Vinnova, since dual use is important. Objective is not to develop products, but to at least demonstrate working prototypes. Important in obtaining financing from civilian sources (SSF and Vinnova) were contacts via Börje Östman (BÖ) and Lennard Lundh (LL).
2. Re contacts, HN will contact Kaj Klarin, Vinnova
3. We should consider employing someone to help in a similar way with the nanotechnology programme. RD to contact LL. Unclear how a consultant can be financed. What will this cost?
4. Budget for existing nano –project presented. This is adequate for year 2001, for 2002 extra additional funding (in addition to the 1.1. Mkr already allocated) will be necessary, in view of additional costs for the planned workshop, and possibility to start some projects under Fall 2002.
5. Agreed SJS to prepare a draft budget for 2002.
6. Agreed Rolf Dahlberg is member of Ag Nano, member list to be updated (SS). (Note, an updated list is attached to these notes)
7. Experiences from the recent Japan study visit were reviewed by HOG and SJS. The visit to the Swedish embassy gave little relevant information, our visit to Japan Defence Agency (JDA) was more useful in establishing a first contact. JDA has no programme on nanotechnology yet, but seems interested in maintaining contact with Sweden in this context. We might invite JDA to the nanotechnology workshop to be held next year. HOG has personal contacts, which are useful, he will be POC with JDA.

8. HOG emphasises we should not repeat earlier mistakes made when USA and Japan tried to jointly develop F16. It is important to listen and cooperate to achieve optimum results. JDA has no mechanisms to fund research at UoH.
9. Torbjörn Nyhlén has funding from Hans Elger to investigate the potential for nanotechnology in protection against B,C weapons. Important to establish contact with him. (Note, SJS has spoken to him recently, he is colleague to Ola Claesson, whom SJS has previously had contact with. SJS will meet Torbjörn in middle of October, will work together on this).
10. Emerging nanosciences workshop in Sigtuna, 11-12 October is nearly full. This is an opportunity to meet most of the Swedish researchers active in nanotechnology. SJS will attend, others are strongly encouraged to. This will be well worth the investment in time.
11. Situation re study visit to USA was discussed. US position is business as usual, Swedish defence attaché in Washington (Peter Lundberg) recommends caution, delay visits if possible. Should we delay? This will reduce the value of the visit, but give us more time to prepare. We agreed to continue planning, but are prepared to postpone if situation changes. RD to submit VR to Swedish defence attaché (copy of details received from SJS) Lars Sandström has arranged his own VR earlier, but has also communicated with Phil Parrish in London. RD recommends we arrange a visit to university lab while in USA. SJS has some contacts which may be used, e.g.UC Irvine or SUNY. Should we pay a courtesy visit to Swedish embassy while in Washington? (What did we decide here?) **NOTE!** On Friday (010928) we agreed to postpone this visit until (provisionally) the last week in January.
12. Time for the workshop agreed to be May/June, preferably not later than end of May to allow time for follow-up before the summer. We agreed provisionally on 16-17 May- Location? TBD, maybe Sigtuna? Must be in or close to Stockholm.
13. Agreed we pay for food + lodging for invited guests (no per diem) plus travel for foreign speakers. We are planning for <100 participants.
14. We need to begin to plan the disposition of the report. Agreed SJS will prepare a draft, and circulate this for discussion. NOTE, an draft is attached.
15. Agreed that we need to prepare a plan for the workshop, with some background, directions, etc, by the end of this year, but a final report does not need to be submitted until next year. An interim report submitted by 011231 will be OK

Appendix 1.5.1 Contact details of Ag Nano members (as of 01-09-20)

Name (avdelning)	Contact details	
Övlt Rolf Dahlberg PLAN B	Försvarets materielverk Banerg. 62 115 88 Stockholm	Tel (dir) 08 782 6245 Mobile Tel (växeln) 08 788 75 00 Fax 08 782 5642 e-post rodah@fmv.se
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Avdir Hans Norinder KC Skydd	Försvarets materielverk Banerg. 62 115 88 Stockholm	Tel (dir) 08 782 61 73 Mobile 070 682 6173 Fax 08 782 61 61 Tel (växeln) 08 782 40 00 e-post hsnor@fmv.se
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APPENDIX 1.6 Meeting notes 2001-10-19 AgNano meeting #3

FM Nanoteknik initiativ

Mötesanteckningar, AgNano möte #3

Datum: 2001-10-19

Plats: FMV Steninge

Närvarande: Hans-Ove Görtz (HOG)
Anders Callenås (AC)
Hans Norinder (HN)
Steven Savage SJS)

Tid: 0900-1300

Notes from the meeting (in no particular sequence)

1. We discussed the name of the nanotechnology programme, and agreed provisionally on NANOTEKNIK I FÖRSVARSTILLÄMPNINGAR, abbreviated to NanoF
2. SJS related briefly relevant items from the Sigtuna nanoscience workshop which he attended (11-12 Oct). Although much of the conference was directed towards biomedicine applications, many of the presentations were quite general. Most of the researchers working on nanoscience in Sweden attended (ca 125 persons). A short presentation of the FM nanotechnology programme NanoF was made. Contact with Bengt Mölleryd (IVA) was made. IVA is also interested in nanotechnology, and could foresee playing some form of coordinating role. IVA is still in the planning stage. I suggested inviting Mölleryd to one of the AgNano meetings to discuss opportunities and advantages of cooperation. He was positive to this suggestion.
3. A new schedule for the study visit to USA was discussed and agreed upon. See appendix 1. Participating in the visit are: AC, HN, RD and SJS. Sören Svensson has his own contact and plans to visit ARL, but would like to coordinate with part of our visit. As soon as we receive confirmation from NRL we can work the other visits around that date. We do not have a good contact at the US Airforce. HN and AC agreed to work on this. Both FMV and FOI have named contact persons (Note, SJS mentioned this to Curt Eidefeldt, who suggested Erik Pricell at FMV could help here). RD recommends we should also visit a university (equivalent) during the visit. SJS suggests contacting Prof Dick Siegel, Rensselaer Polytechnic Institute, NY. Dick has visited Sweden several times, has been an important figure in the US nanotechnology planning activities and a member of the reference committee to the SSF (previously NUTEK) material consortia. SJS agreed to contact Dick and discuss a possible visit. We agreed (in his absence) that RD would submit the clearance application.
4. We discussed contacts with other (civilian) funding agencies, including Vinnova, SSF, IVA, Vetenskapsrådet, etc. We agreed HN would contact Vinnova again (previous contact with Kaj Klarin was not promising), We agreed to invite Bengt Mölleryd to one AgNano meeting. SJS to arrange. SJS will look into nanotechnology activities at SSF and Vetenskapsrådet.

5. A www address has been created to use for information distribution. This is still under construction, although the address exists (www.nano.foi.se). Part of this will be password protected, part open. Everything lies outside FOI's firewall, so security is not very high.
6. The workshop scheduled for 16/17 May 2002 was discussed. We agreed on the dates as suggested. Locations in Stockholm (Hotel Ariadne, Lidingö), Sigtuna and Upplands Väsby (Eurostop) were discussed. Ariadne and Eurostop were preferred due to ease of transport and cost. SJS was to investigate these further and book the one he though best. (Note, this is done: Eurostop). Rooms for 60 persons have been booked, plus one large conference room and a number of smaller ones. Cost is (very roughly calculated) about 100 kkr. We also discussed briefly a programme for the workshop, starting with a provisional programme by SJS. HOG suggested some amendments, concentrating the first day of the programme into a morning session (1000-1200, introduction and invited lectures) and an afternoon session (1300-2000, discussion in groups and invited lectures). Dinner would be at 2000, followed by informal discussions. The first suggestion is given in appendix 2, we need to discuss this in more detail.
7. We discussed who should be invited to the workshop, and agreed that all should think about this question and begin to formulate suggestions.
8. SJS presented a proposal for the organisation of NanoF, based on that of the Fotonics Programme. We do not need to decide upon this yet, but the outline presented was accepted, with modifications that names be removed at this stage, and with the addition of a industry representative and FOI to the steering group. See appendix 3.
9. The composition of AgNano was discussed, it was agreed to invite Curt Eidefeldt to be a member. Curt has been actively supporting "nanotechnology"for some time now.
10. The question of what activities other (foreign) defence organisations have concerning nanotechnology, e.g. within the 6-Nations group was raised. AC agreed to check this.
11. Concerning financing of the FM Nanotechnology programme, this still looks OK, although no decisions have been reached yet. Start date is still January 2003, although it would be an advantage if we can make a start during autumn 2002 (see §12)
12. SJS raised the "invitation" from ONREUR to jointly finance a programme of research into nanoelectronics at Lund TH. A copy of the pre-proposal was circulated (appendix 4). SJS plans to visit Lund to discuss this, if possible together with Mark Taylor from ONREUR. AC and Bertil Brusmark (FOI) may also be interested. No commitments have been made, but there are a number of obvious advantages of jointly funding some parts of this programme, not least of which would be increased interaction with ONR. The funding issue would need to be resolved if we want to start before Jan '03. AC agreed to look into the possibilities within the FoT group.
13. HN has circulated information about NanoF to the chairmen of the FoT groups within FMV. Some positive responses have already been received. See appendix 5.
14. For information, the next international conference on Nanostructured Materials will be held June 16-21, Orlando, Florida. http://www.nano2002.com
15. We discussed a number of examples of the type of project which are interesting for NanoF (Appendix 6). SJS presented one (autonomous sensors for surveillance) in more detail (appendix 7). The purpose of this is to give presumptive applicants some indication of the directions and priorities of NanoF. Other ideas are welcome. Should we indicate the "visions" alternatively "functions" required in defence, and allow the applicants to use their creativity in suggestion solutions?

A summary list of "to do" items is attached

Steven J. Savage

Appendix 1.6.1 Study visits USA (new proposal)

Dates: week 5, 28 Jan-1 Feb

Visits:

1) Naval Research Laboratory, NRL, Washington DC (http://www.nrl.navy.mil/) Office of Naval Research, ONR, will also be there (http://www.onr.navy.mil/)

Contact persons: Phil Parrish (will be replaced by Mark Taylor)/Steven Savage. We only need to confirm**. Note: this is being done. No reply yet received (011115)**

2) Army Research Office, ARO, North Carolina (http://www.aro.army.mil/index.htm)

Contact persons: William Mullins/Hans Norinder. We only need to confirm. **Note: HN to take care of this, when date for visit to NRL confirmed.**

3) Air Force Office of Scientific Research, AFOSR (http://www.afosr.af.mil/)

Contact persons: **???? We need to establish a contact! Note: SJS has spoken to Curt Eidefeldt (FMV) he may be able to help, via Erik Prisell. AC and HN to find who are the POCs at FOI and FMV**

4) Tekniska attachén, Washington DC (http://www.statt.se/extern/2001/)

Contact persons: **???? We need to establish a contact!**

5) Rensselaer Polytechnic Institute, RPI (http://www.rpi.edu/) Prof Dick Siegel, one of the leaders in nanotechnology materials research, has special contacts with Sweden

Contact persons: Dick Siegel/Steven Savage. We need to contact and arrange visit. **SJS to contact and arrange visit if possible**

Clearance application

Must be submitted again, at latest v 47. Who takes care of this? **Agreed (in his absence) RD will do this, when the dates are confirmed.**

Appendix 1.6.2 Nanotechnology workshop (programme v1)

Dates: 16-17 May 2002 (Thursday-Friday)

Location: suggestions (only Kronhotell considered)

1. Scandic Ariadne (Ropsten/Lidingö). New hotel, nice views, close to T-bana
2. Lidingö Skoglund Wiik
3. Eurostop Arlanda. Convenient for Arlanda
4. ?

How many persons? Photonics programme had circa 40. We should limit us to max 60

Cost? Circa 1500 kr/head (accomodation + meals), + meeting rooms, refreshments, etc. Max circa 100 kkr.

Who to invite?

Invited speakers?

Prof Peter Dobson, Univ. Oxford, UK
Someone from SSF/Vinnova/IVA/Vetenskapsrådet
Someone from (Swedish) industry (ABB, Saab, Bofors, Ericsson, etc)
Someone from US DoD

Programme

16 May 2002
1030 – Intrduction, objectives and organisation of workshop.
1130-1230 - Lunch
1230-1400 – 2 lectures (invited speakers)
1400-1430 – Pause
1430-1630 - 2 lectures (invited speakers)
1630-1730 – Discussion, questions, working groups, tasks (project proposals)
1830-1930 – Dinner
1930- Discussions in working groups (elect chair for discussion groups)

17 May 2000
0900-0930 - Revision of discussion group tasks (project proposals)
0930-1100 - Discussion, project proposals (coffee served)
1100-1230 – Lunch (chairs prepare overview of group results)
1230-1400 - Presentation of results
1400-1430 - Pause
1430-1500 - Summary

Appendix 1.6.3 Organisation of nanotechnology programme

Name of programme? **NanoF Nanoteknik i försvarstillämpningar**

Nanotechnology in defence (NanoDef)
Defence nanotechnology

Steering group: about 6 persons total (not PL)

Function: administrative, financial + following-up

Members:
HkV ()
FMV ()
Vinnova/SSF/Vetenskapsrådet
FOI
Industry
One/two more

Management group: about 10-12 members

Function: management, planning, etc
Members
Steering group
PL's

Reference group: 3-5 members

Function: scientific advice, "quality assurance"
Members: scientific experts (foreign, domestic)

Project groups: decided by each PL
Function: project management, coordination of sub-projects, project planning, etc

Appendix 1.6.4 Brev KC Skydd 10 591:31199/01

INFORMATION

Datum	FMV beteckning
2001-09-19	KC Skydd 10 591:31199/01

Sändlista

Er referens	Ert datum	Er beteckning
FMV tjänsteställe, handläggare KC SkyddB, Material, Hans Norinder, 6173	FMV föreg. datum	FMV föreg. beteckning

Nanomaterial – kan positivt påverka alla Materielsystem

Under hösten ’01 pågår förberedande aktiviteter inför ett planerat program inom området nanoteknik. En arbetsgrupp - Ag Nano har bildats. Den genomför planering, studiebesök, nätverksbyggande m m fram till årsskiftet. Under våren ’02 anordnas en workshop där nanoteknikprogrammets innehåll, prioriteringar, finansiering, m m diskuteras och utformas. Programmet förväntas starta januari ’03.

Nanoteknik erbjuder hittills oanade möjligheter att konstruera och framställa material och materialstrukturer med skräddarsydda egenskaper och egenskapskombinationer. De flesta länder investerar mycket pengar i nationella program inom området. I USA satsas fem miljarder årligen och motsvarande belopp satsas inom Europa. För försvaret finns stora möjligheter att förbättra befintliga materieltillämpningar, men än viktigare är att demonstrera nya tillämpningar, som inte finns ännu. Sådana tillämpningar kan finnas inom t ex multifunktionella spaningssystem, signaturanpassning, vapensystem, m m.

Hur kan dessa möjligheter användas på optimalt sätt? Hur kan man prioritera mellan t ex genomskinliga lastbärande radarabsorbenter och självsanerande textiler? Eller välja mellan mycket effektivare raketbränsle och bättre skydd mot laser vapen? Hur kan vi identifiera de funktioner som inte finns idag, men som behövs för framtidens försvar? Tidsperioden som avses gäller huvudsakligen från knappt 15 till omkring 30 år.

Kortfattat – hur införs dessa nya tekniska möjligheter i framtidens försvarsmateriel?

Syftet med denna korta information är att etablera kontakt med berörda personer i de olika FoT grupperna inom FMV. Vi vill dels informera om nanoteknik programmet, dels bygga ett nätverk för fortsatt informationsutbyte.

Vi är tacksamma om du kan identifiera lämpliga personer i din FoT grupp som är beredda att hjälpa oss med att bereda nanoteknik programmet.

För ytterligare uppgifter kontakta någon av oss inom Ag Nano:

Hans Norinder, FMV KC Skydd, hsnor@fmv.se, tfn 08-782 61 73
Hans-Ove Görtz, HKv STRA PLAN, hans-ove.gortz@hkv.mil.se, tfn 08-7 887 778
Anders Callenås, FOI, Marknadsenhet, anders.callenas@foi.se, tfn 013- 378 265
Steven Savage, FOI, Inst. för Material, steven.savage@foi.se, tfn 013- 378 431

Med vänlig hälsning

Hans Norinder

Sändlista:
FoT ordförande och företrädare

Appendix 1.6.5 Examples of potential projects

1. Autonomous sensor systems for surveillance
2. Electrical energy supply for future warrier
3. Protection against B and C weapons
4. Multifunctional nanocomposites
5. Surface coatings
6. Sensors in extreme environments
7. Personal health control

Appendix 1.6.6 Nanotechnology in Defence

Example of project preproposal:

Autonomous sensors for surveillance

This is an example of a **system** solution

Dominant Battlefield Awareness

Need: to obtain information relating to the following

- Presence/absence of persons in an area (forest, mountain, desert, street, building, sea?)?
- Vehicles/type/number?
- Size of group?
- Military/civilian?
- Static/mobile?
- Direction of movement?
- Speed of movement?

Aim is to enable remote surveillance of large geographical areas and/or limited built-up areas, without revealing own presence. ”silent surveillance”

How?

Distributed sensor networks. Large numbers (10’s-1000’s) distributed in advance, or by aeroplane/helicopter/artillery, using same technology as mines. Smart dust concept, but sensors about the size of a matchbox, small enough to be difficult to detect.

The sensor package is self contained, and contains relatively simple sensor elements:

- Acoustic sensor – sound is omnidirectional, difficult to avoid, especially if the enemy does not know the area is under surveillance
- Chemical sensor – detect chemical signals from vehicles, weapons, explosives, heating, etc.
- Optical sensor – infra red in the first instance, does not need to be too complicated, but must be uncooled.
- Magnetic sensor – difficult to avoid producing a change in the local magnetic field
- Energy supply – should be very compact, based on nanotechnology, solar cells, thermoelectric material, fuel cells, supercondensors, etc, etc.
- Data fusion
- Position - GPS
- Wireless communication

Mode of operation – smart! But **distributed** intelligence (based on www concept). Individual sensors are fairly dumb

Sensor detects sound (probably the first indication). False alarm? Interrogate neighbouring sensor. Do you hear/see/smell anything? YES/NO. If yes interrogate neighbouring sensors in

same way, if no assume a false alarm. Use other sensor functions to confirm, e.g. IR, chemical, magnetic. When a critical number of sensors have detected a signal, assume this is a real alarm. What to do?

- Alarm HQ directly
- Wait and see what develops (gives indication of size of force, direction, speed). Respond when HQ calls
- Alarm HQ when activity has moved away (**silent** surveillance)
- Send out a microUAV, which sends live pictures to HQ (microUAV lives in a tree/stone/hole)

Detection/removal of one or more sensors will not reduce the effectivenesss of the system greatly (compare with internet)
Cooperation between sensors increases the intelligence of the system

"TO DO" list

WHO	TASK	RESULT
SJS	Confirm NRL visit	No reply yet (011115)
HN	Confirm ARO visit	
HN	Contact FMV PoC with USAF	
AC	Contact FOI PoC with USAF	
SJS	Contact Curt Eidefeldt, invite to AgNano	Done, he accepts to be a member of AgNano
SJS	Contact Prof Siegel, RPI, arrange visit	
RD	Arrange clearance application when dates of visit confirmed (HN has all personal details)	
HN	Contact Vinnova	
SJS	Contact Bengt Mölleryd, invite to AgNano meeting for discuss possible cooperation	
SJS	Book workshop location	Done: Eurostop
AC	What nano activities are on-going/planned at other defence organisations, incl.6 nations?	
SJS	Arrange visit to LTH	Done, provisionally 13 Dec.
AC	Look into possibilities to start funding NanoF from autumn 2002 ("tjuvstarta")	
All AgNano	Is name: Nanoteknik i försvarstillämpningar, NanoF OK?	
All AgNano	Collect names of persons to invite to workshop	
SJS	Check, what are SSF, Vetenskapsrådet doing in nano?	

APPENDIX 1.7 Meeting notes 2001-11-22 AgNano meeting #4

FM Nanoteknik initiativ

Mötesanteckningar, AgNano möte #4

Datum: 2001-11-22

Plats: Hkv Lidingöv 24

Närvarande: Hans-Ove Görtz (HOG)
Rolf Dahlberg (RD)
Anders Callenås (AC)
Hans Norinder (HN)
Steven Savage SJS)

Tid: 1000-1200

Notes from the meeting (in no particular sequence)

1. No comments on the minutes from the previous meeting were received
2. The schedule for our study visit to USA was discussed. This is now (2001-12-12) more or less finalised, according to the attached schedule. Appendix 1
3. We decided the Nanotechnology workshop will be held at Hotel Eurostop, Märsta, 16/17 May 2002.
4. We agreed the results of this years work will be registered as a "memo"
5. We worked through the "to do" list. This has been updated and is attached. Appendix 2
6. We discussed the relation between needs of the Defence Forces: *functions*, the work of FMV: to procure *systems*, the results of industry: *products*/*components*, and the research/development done by FOI: *nanomaterials/nanoteknik* Appendix 3
7. Next meeting 14 Dec, FMV:s training locale: Sehlstedtsg, 7-9, Bamse, in combination with the Saab-Bofors Dynamics seminar.

Appendix 1.7.1 Study visits USA (schedule as of 2001-12-12)

Dates: week 4/5, 24-30 Jan

Participants:
Rolf Dahlberg (maybe must return 29 Jan?)
Hans Norinder
Anders Callenås
Sören Svensson
Steven Savage

Itinerary

Wednesday 23 Jan. Travel day. Depart Sweden, arrive Albany, USA

1) Thursday, 24 Jan. Rensselaer Polytechnic Institute, Troy, NY. PoC Prof Dick Siegel/Steven Savage (http://www.rpi.edu/) **Visit confirmed**

2) Friday, 25 Jan. Maybe visit STATT, Washington DC? (http://www.statt.se/extern/2001/) **Visit to be decided!**

Saturday/Sunday in Washington DC

3) Monday, 28 Jan. Naval Research Laboratory, NRL, Washington DC (http://www.nrl.navy.mil/) Office of Naval Research, ONR, will also be there (http://www.onr.navy.mil/) PoC Dr Bhakta Rath/Steven Savage **Visit confirmed**

4) Tuesday. 29 Jan. Army Research Laboratory (close to Washington). PoC Sören Svensson/Gary Wood/John Polk **Visit confirmed**

5) Wednesday, 30 Jan. Army Research Office, ARO, North Carolina (http://www.aro.army.mil/index.htm) PoC Dr William (Bill) Mullins/Hans Norinder **Visit not yet confirmed??**

Clearance application

Submitted by Hans Norinder for everyone

Appendix 1.7.2 "TO DO" list

WHO	TASK	RESULT
SJS	Confirm NRL visit	Confirmed
HN	Confirm ARO visit	
HN	Contact FMV PoC with USAF	
AC	Contact FOI PoC with USAF	
SJS	Contact Curt Eidefeldt, invite to AgNano	Done, he accepts to be a member of AgNano
SJS	Contact Prof Siegel, RPI, arrange visit	Confirmed
RD	Arrange clearance application when dates of visit confirmed (HN has all personal details)	Done (by HN)
HN	Contact Vinnova	
SJS	Contact Bengt Mölleryd, invite to AgNano meeting for discuss possible cooperation	Done – no result yet
SJS	Book workshop location	Done: Eurostop
AC	What nano activities are on-going/planned at other defence organisations, incl.6 nations?	
SJS	Arrange visit to LTH	Done, provisionally 13 Dec.
AC	Look into possibilities to start funding NanoF from autumn 2002 ("tjuvstarta")	
All AgNano	Is name: Nanoteknik i försvarstillämpningar, NanoF OK?	Agreed OK
All AgNano	Collect names of persons to invite to workshop	
SJS	Check, what are SSF, Vetenskapsrådet doing in nano?	

Appendix 1.7.3

Syftet med diagrammet är att visa avståndet mellan vad försvaret behöver, som specificeras som funktioner, vad FMV upphandlar som system, vad industri producera och vad FOI leverera i formen av forskningsresultat. Avståndet är lång, men MÅSTE överbryggas om nanoteknik programmet ska lyckas.

VEM	VAD KRÄVS
FÖRSVARET	FUNKTIONER, t ex Övervakning Skydd - mot upptäkt - ballistisk - B, C vapen - Etc Verkan - stridsdelar - robotar - energetiska material - flyg farkoster - framdrivning - strukturer - UAV, mikro UAV, satellit, ballong, m m
FMV	SYSTEM UTVECKLING/INKÖP
INDUSTRI	PRODUKTER, DELSYSTEM, KOMPONENTER, RESERVDELAR, m m
FOI	FORSKNING –NANOMATERIAL/TEKNIK

APPENDIX 1.8 Meeting notes 2001-12-14 AgNano meeting #5

FM Nanoteknik initiativ

Mötesanteckningar, AgNano möte #5

Datum: 2001-12-14

Plats: FMV Sehlstedtsg 7-9, Bamse

Närvarande:Hans-Ove Görtz (HOG)
Rolf Dahlberg (RD)
Anders Callenås (AC)
Hans Norinder (HN)
Steven Savage SJS)
Sören Svensson (SS)

Tid: 1400-1600

Notes from the meeting (in no particular sequence)

1. Prior to the meeting we had a seminar and discussions with Saab-Bofors Dynamics on the potential of nanotechnology in high velocity missiles. The discussions were constructive, and a number of ideas were generated. SJS will write up the notes (separately) and distribute for comment.
2. Prior to the AgNano meeting we met Dr. Mark Taylor from ONR London office. This was primarily a courtesy visit.
3. No comments from the minutes of the previous meeting (#4) were received.
4. Remind Hans-Ove about diskette!
5. We discussed and finalised our itinerary for USA study visit (Appendix 1)
6. We discussed and outlined AgNano activities for January – June 2002 (Appendix 2)
7. Continued difficulty with distribution notes, etc by e-mail using Word. There is always someone who cannot read the file. Try with pdf format.

God jul och Gott Nytt År till alla medlemmar i AgNano!

At the keyboard

Steve

Appendix 1.8.1 Study visits USA (schedule as of 2001-12-20)

Dates: week 4/5, 24-30 Jan

Participants:
Rolf Dahlberg
Hans Norinder
Anders Callenås
Sören Svensson
Steven Savage

Itinerary

Tuesday 22 Jan. Travel day. Depart Arlanda, arrive Albany, USA
Wednesday, 23 Jan. Discussions + rest day
1) Thursday, 24 Jan. Rensselaer Polytechnic Institute, Troy, NY. PoC Prof Dick Siegel/Steven Savage (http://www.rpi.edu/) **Visit confirmed**

Depart Albany in evening, arrive Rayleigh, NC

2) Friday, 25 Jan. Army Research Office, ARO, North Carolina (http://www.aro.army.mil/index.htm) PoC Dr William Mullins/Hans Norinder **Visit confirmed**

Depart Rayleigh, arrive Washington DC

Saturday/Sunday in Washington DC

3) Monday, 28 Jan. Naval Research Laboratory, NRL, Washington DC (http://www.nrl.navy.mil/) Office of Naval Research, ONR, will also be there (http://www.onr.navy.mil/) PoC Dr Bhakta Rath/Steven Savage **Visit confirmed**

4) Tuesday, 29 Jan. Army Research Laboratory (close to Washington). PoC Gary Wood/John Polk/Sören Svensson **Visit confirmed**

Depart Washington via Baltimore airport

Wednesday arrive Stockholm

Clearance application

Submitted by Hans Norinder for everyone

Appendix 1.8.2 Outline AgNano activity plan 2002-01-01—2002-06-30

Date	Time	Location	Comments
16 Jan	1000-1200	FMV Tyresö	AgNano meeting #6 Final planning before USA trip. What do we expect to learn? What questions do we need answered?
22-30 Jan		USA	Study visits
6 Feb	0930-1430	FOI Lin	AgNano meeting #7 Summary after USA trip. What did we learn? Continued planning for workshop Finalise “nanoteknik för försvarsindustri” course invitation
7 March	1000-1200	FMV	AgNano meeting #8
Week 11		FOI Lin	Course “nanoteknik för försvarsindustri”
19 March			Deadline, preliminary proposals from industry
21 March	1000-1200	FMV	AgNano meeting #9 Sort/discuss proposals received
4 April	1000-1200	FMV	AgNano meeting #10
18 April	1000-1200	FMV	AgNano meeting #11
7 May	1000-1200	FMV	AgNano meeting #12
16/17 May	All day	Eurostop/Märsta	Nanoteknik workshop
30 May	All day	FMV	AgNano meeting #13 Evaluation of workshop results
14 June	1000-1400	FMV	AgNano meeting #14 Discussion of report
30 June			Report deadline

Appendix 1.9 Meeting notes 2002-01-16 AgNano meeting #6

FM Nanoteknik initiativ

Mötesanteckningar, AgNano möte #6

Datum: 2002-01-16

Plats: FMV Banerg, Tyresö

Närvarande:Hans-Ove Görtz (HOG)
Rolf Dahlberg (RD)
Anders Callenås (AC)
Hans Norinder (HN)
Steven Savage SJS)
Sören Svensson (SS)

Tid: 1000-1230

Notes from the meeting (in no particular sequence)

Two main topics were discussed, planning for the introduction to nanotechnology "course" and final arrangements for the upcoming study visit to USA. We briefly discussed and made some minor changes to our activity plan for January-June 2002. The amended activity plan is attached (Appendix 1).

Nanotechnology for industry "course," preliminary date 14 March, information about this to be finalised at the AgNano meeting on 6 Feb and distributed as soon as possible thereafter. Information distributed to as many potential participants as possible, including UoH. See attached preliminary distribution list (Appendix 2), please add to this your own suggestions. A new title was suggested: *Försvarsorienterade nanoteknik: information inför kommande nanoteknik programmet*. Some preliminary information about times, date, place, content, etc is attached (Appendix 3). Please review this as we must make a decision on 6 Feb. It may be possible for FM to finance this course, estimated cost 80 kkr, which will enable us to allow free participation (maybe must be limited if too many from same organisation will participate). HN will check if funds available. Documentation will be posted on WWW, free to download for all.

The program for USA visits was reviewed. All arrangements are now made, hotels reserved (SS must cancel his room in Washington for Friday and Saturday nights, 25/6 jan). The itinerary is given in Appendix 4, including details of our hotels and approximate times for the visits. We must think carefully what information we expect to gain from this trip. Some questions are given in Appendix 5. Note, regarding visa requirement, AC has checked with US Embassy, a visa is not essential, even for business visitors (although recommended).
Concerning gifts to our hosts in the USA, AC will check with Lars Sandström what is customary for visits to US defence organisations, and bring appropriate gifts.

SJS will prepare a short presentation of the status of the Swedish nanotechnology program, to present at ARL (and maybe other sites).
Don’t forget your business cards!
Short biographies have been written for all except RD. These are attached (Appendix

No comments were received concerning the notes from meetiing #5. Thanks to HOG for the Japan picture diskette!

At the keyboard

Steve

Appendix 1.9.1 Outline AgNano activity plan 2002-01-01—2002-06-30

Date	Time	Location	Comments
16 Jan	1000-1200	FMV Tyresö	AgNano meeting #6 Final planning before USA trip. What do we expect to learn? What questions do we need answered?
22-30 Jan		USA	Study visits
6 Feb	0930-1430	FOI Lin	AgNano meeting #7 Summary after USA trip. What did we learn? Continued planning for workshop Finalise “nanoteknik för försvarsindustri” course invitation
7 March	1000-1200	FMV	AgNano meeting #8
14 March	0930-1700	FOI Lin	Course “nanoteknik för försvarsindustri”
21 March	1000-1200	FMV	AgNano meeting #9 Sort/discuss proposals received
4 April	1000-1200	FMV	AgNano meeting #10
12 April			*Preliminary* proposals received from industry
18 April	1000-1200	FMV	AgNano meeting #11
19 April			Workshop program skickas ut
7 May	1000-1200	FMV	AgNano meeting #12
16/17 May	All day	Eurostop/Märsta	Nanoteknik workshop
30 May	All day	FMV	AgNano meeting #13 Evaluation of workshop results
14 June	1000-1400	FMV	AgNano meeting #14 Discussion of report
30 June			Report deadline

Appendix 1.9.2 Preliminary distribution list
Försvarsorienterade nanoteknik: information inför kommande nanoteknik programmet.

Name	Address	Telephone, e-mail
Jan-Olov Genberg	Saab-Bofors Dynamics 581 88 Linköping	(013) 186590 jan-olov.genberg@dynamics.saab.se
Martin Stålfors	Saab Vetronics Nettov 6, 175 88 Järfälla	(08) 580 85656 mrst@systems.saab.se
K. G. Lövstrand	FMV	
Doc. Lennart Bergström	Ytkemiska institutet AB Box 5607 114 86 Stockholm	(08) 790 9991 lennart.bergström@surfchem.kth.se
Col. Yunosuke Kawazu	Embassy of Japan Gärdesg 10 115 27 Stockholm	(08) 663 0440 yunosuke.kawazu@mofa.go.jp
AgNano		
Torbjörn Tjärnhage	FOI NBC Skydd Cementv. 20 901 82 Umeå	6728 torbjorn.tjarnhage@foi.se
Bengt Mölleryd	IVA	
Jan Andersson	ACREO	
Gunnar Westin	Uppsala universitet	Gunnar.westin@mkem.uu.se
Peter Edman	Saab Barracuda	
	Kitron Development AB	
	Nanoprodukter AB Ronneby	
	Bofors Defence	
Mikael Jakob	FOI Grindsjön	
Tore Gustafsson	Hägglunds Vehicles	
Martin Borgh	FMV Farkost	

Appendix 1.9.3 version 020116

Kurstiteln:

Försvarsorienterade nanoteknik: information inför kommande nanoteknik programmet

Syfte:

Att informera i första hand försvarsindustrin om nanoteknik –

Vad är nanoteknik?
Varför är det viktig?
Vilken egenkaper utmärkar nanostrukturella material?
Läget i dag?
Försvarstillämpningar för nanoteknik

Målet är att efter kursen har försvarsindustrin fått nog med information att kunna tänka ut idéer och förslag för ytterligare bearbetning vid nanoteknik workshopen som hölls 16-17 maj. Möjligheten ges även för ytterligare diskussioner ”i enrum” för de företag som önska detta.

Förutsättningar:

Max 1 dag
Självfinansiering (OBS, ev finansieras av FM)
4-5 föredrag
1-2 inbjudna föredragshållare

Deltagare:

I första hand försvarsindustri, ev. även FHS, FMV (UoH?) Ca 40 st

Datum:

14 mars

Tid:

0900 – 1700

Plats:

FOI Linköping, ”Stämman”

Innehåll:

Introduktion till nanoteknik – vad är det?
Egenskaper hos nanostrukturella material
Nanotekik programmet – syfte, tidsram, finansiering, m m
Försvarstillämpningar för nanoteknik – några idéer
Dokumentation. Pärm innehållande kopior av OH bilder, informationskällor.

Kostnad:

Ca 2000 kr/person, inkl fika, lunch, dokumentation OBS, förhoppningsvis finansieras av FM, då utgör ingen kostnad för deltagare. I så fall dokumentation även läggs ut på WWW.

Appendix 1.9.3 forts. version 020116

Försvarsorienterade nanoteknik: information inför kommande nanoteknik programmet

0900-0930 Registrering, utdelning av dokumentation, m m
0930-0945 Välkomsttal, av AC Dr. Svante Ödman
0945-1030 FM nanoteknikprogrammet, av Hans-Ove Görtz (alt1) eller Rolf Dahlberg (alt 2)
- Bakgrund
- Tidtabell
- Finansiering
- Organisation
- Workshopen, m m

1030-1045 Paus, kaffé, té, vatten, frukt
1530-1630.1 Överblick, vad är nanoteknik, varför är det viktig för försvaret? Av Steven Savage
- Definition
- Förhållanden till andra material, elektronik, MEMS, m m
- Framställning av nanomaterial
- Egenskaper hos nanomaterial
- Tillämpningar hos nanomaterial

1145-1245 Lunch, ev lunchpaket, diskussioner fortsätter under lunch
1245-1345 Industriella tillämpningar hos nanoteknik:
- Doc Olle Grinder, PM Technology AB

1345-1400 Paus, kaffé, té, vatten, frukt eller kanske bara en bensträckare
1530-1630 Nanoteknik i sensortillämpningar, av Eva Hedborg-Karlsson
1530-1631 Optiska egenskaper hos nanomaterial, av Hans Kariis
1500-1530 Paus, kaffé, té, vatten, frukt eller kanske bara en bensträckare
1530-1630 Nanokompositer i försvarstillämpningar, av Steven Savage eller prof Ulf Gedde, KTH
1630-1700 Internationella aktiviteter, USA, EU, m m av Steven Savage

Övriga tänkbara ämne inkludera nya materiel inom försvaret, eller en diskussionspanel. Man kan även tänker sig att stanna kvar för de som ville och under kvällen diskutera vad som helst

Amn: B,C sensor och skydd, sensorer, ledningssystem är viktiga områden! Måste trycka på producerbarhet och prestanda!

Appendix 1.9.4 Study visits USA (schedule as of 2002-01-16)

Dates: 22-30 Jan

Participants:
Rolf Dahlberg (ej till RPI)
Hans Norinder
Anders Callenås
Sören Svensson
Steven Savage

Itinerary
Tuesday 22 Jan. Travel day. Depart Arlanda FI 307, 1330, via Keflavik, arrive Albany, 2050
Hotel: Courtyard Albany Thruway, 1455 Washington Avenue, Albany, NY 12206
Phone: 1-518-435-1600
Fax: 1-518-435-1616
Wednesday, 23 Jan. Discussions + rest day
1) Thursday, 24 Jan. Rensselaer Polytechnic Institute, Troy, NY. PoC Prof Dick Siegel/Steven Savage (http://www.rpi.edu/) **Visit confirmed.** 0845-ca1500
Depart Albany UA7507, 1845, via Washington-Dulles, arrive Rayleigh, NC 2205
Hotel: Holiday Inn Raleigh-Durham airport, I40 and New Page Road, Research Triangle, NC 27799
Phone: (919) 941 6000
Fax: (919) 941 6030

2) Friday, 25 Jan. Army Research Office, ARO, North Carolina (http://www.aro.army.mil/index.htm) PoC Dr William Mullins/Hans Norinder **Visit confirmed.** 0900-1600 (approx times)

Depart Rayleigh, UA 7484, 1835, arrive Washington-Dulles 1947
Hotel: River Inn, 924 25th Street Northwest, Washington DC 20037
Phone: (202) 337 7600
Fax: (202) 337 6520

Saturday/Sunday in Washington DC

3) Monday, 28 Jan. Naval Research Laboratory, NRL, Washington DC (http://www.nrl.navy.mil/) Office of Naval Research, ONR, will also be there 0(http://www.onr.navy.mil/) PoC Dr Bhakta Rath/Steven Savage **Visit confirmed.** 0930-1200 (NRL), 1300-1600 (estimated times) ONR/AFOSR

4) Tuesday, 29 Jan. Army Research Laboratory (close to Washington). PoC Gary Wood/John Polk/Sören Svensson **Visit confirmed**. 0900-?
Depart Washington via Baltimore airport FI 642, 2015, via Keflavik, Stockholm 1140 Wednesday

Clearance application

Submitted by Hans Norinder for everyone

Appendix 1.9.5

Studiebesöket till USA kommer att kosta ca 65 kkr/person. Vad kommer vi att tar hem med oss?

Svar på följande frågor?

What Activities?
Research areas?
Materials?
Applications?
Functions?
are prioritised by the various US defence laboratories?

Why?

What is the timeframe for production of:
Useful knowledge?
Practical materials?

How do universities/companies and defence laboratories cooperate in their research?
Exchange of materials?
Exchange of results?
Sharing facilities/instruments?
Joint research?

How is funding allocated, i.e. what makes a good project proposal?

What opportunities exist (if any) for cooperation between FOI/FMV/Hkv/USA?

What lessons have our American colleagues learned? What was good, what was bad?

How have they defined nanotechnology?

Appendix 1.9.6 Biographies of the visiting team

Dr. Hans Norinder
Program manager, Defence Materiel Administration (FMV), SE-115 88 Stockholm, ‘phone: +46 (0)8 782 4000, e-mail: hsnor@fmv.se

Hans Norinder graduated in 19?? with a degree in ??, and obtained a doctorate in welding technology at the Royal Institute of Technology in 19??. Since 19??. Dr. Norinder has been employed at the Defence Materiel Administration (FMV), and today is program manager responsible for research and development of materials not yet directed towards any specific system or application. He is also responsible for quality control of welded structures in defence systems.

Mr. Sören Svensson
Head of Functional Materials department, Defence Research Agency (FOI), P.O. box 1165, SE-581 11 Linköping, ‘phone: +46 (013) 37 8000, e-mail: sorsve@foi.se

Sören Svensson acquired a M.Sc. in technical physics and applied electronics 1977 at Linköping Institute of Technology. After two years in industry he was in 1979 employed by what was to become the Swedish Defence Research Agency (FOI). He is presently head of the Department of Functional Materials at the Division of Sensor Technology. Apart from some activities in image analysis his main interest during the 80:ties was underwater technology, particularly hydro-optics. His responsibilities included development of test systems, measurements, system tests and technology evaluation. In 1980 the Royal Swedish Navy certified him shallow salvage diver. From 1984 to 1988 he was head of the group for hydro-optics. Since the early 90:ties he has been manager of a project on sensor and eye protection against laser radiation. The project includes issues from material modelling and synthesis via component evaluation to system design philosophies. In 1998 he was appointed head of his then newly formed department. The department deals with various material aspects of sensors and low observables.

Dr Anders Callenås
Program Manager, Marketing unit, Defence Research Agency (FOI), P.O. box 1165, SE-581 11 Linköping, ‘phone: +46 (013) 37 8000, e-mail: andcal@foi.se

Anders Callenås is Programme Manager in the technology area of Materials Science and the technology area of Electromagnetic Weapons and protection. He received his MSc and PhD i Physics at the University of Linköping (Sweden). His doctoral thesis was in the field of photoelectron spectroscopy: Studies of some transition metal nitrides and carbides using the angle resolved photoemission technique. Dr Callenås has been with Swedish Defence Research Agency since 1985 and his research (1985-1992) has been in the Laser area. During 1993-1994 he was Head of the Optical Technology Division. Since 1995 he has been working as a Programme Manager, liasing between FOI, FMV and defence headquarters

Dr Steven Savage
Project manager nanotechnology, Defence Research Agency(FOI), P.O. box 1165, SE-581 11 Linköping, ‘phone: +46 (013) 37 8000, e-mail: stesav@foi.se

After graduating from Salford University (UK) with a MSc in Analytical Chemistry he obtained a PhD in Applied Physics from the University of Hull (UK). He was employed at the University of Sheffield as research assistant in the department of materials science and engineering until leaving for the USA where he was a visiting scientist (NRC Associate) during 1982-5. From the USA he moved to Stockholm, Sweden where he was Group Leader (Special Materials) at the Institute of Metals Research until moving to the Defence Research Agency in 1991. His research has mainly been concerned with processing and properties of functional materials, and powder metallurgical materials, but has also included the measurement of mechanical properties of metals and alloys under high speed loading. Since 1999 he has been responsible for initiating a new program on defence applications of nanotechnology. He also holds an unpaid position as associate professor at the Royal Institute of Technology.

Mr Rolf Dahlberg
Director of Research and Technology, Joint Materiel Command, Defence Material Administration (FMV), SE-115 88 Stockholm, ‘phone: +46 (0)8 782 4000, e-mail: rodah@fmv.se

Mr Dahlberg was born in mid-Sweden in 1952. After finishing his officer’s training in 1975, Mr Dahlberg joined the Artillery where he served until 1981 and again some years later for another two periods, 1989-90 and 1994. Mr Dahlberg was educated in military technology at the Swedish Defence Academy in 1982-84. Since then Mr Dahlberg has served as an officer with technology-oriented issues except for his periods of service in the artillery.

Mr Dahlberg worked at the FMV Mobility directorate for three years, 1986-88, and was responsible for development of ballistic protection technology. As a part of this responsibility Mr Dahlberg was leader of the survivability development of Combat vehicle 90.

Mr Dahlberg worked at the Defence Academy for almost three years, 1991-93, as leader of the Army Technical Course. Mr Dahlberg has worked for two periods as director of R&T in the Armed Forces Headquarters, 1995-97 and 2000. During 1998 and 1999 Mr Dahlberg worked at FMV as director of FMV support to the Armed Forces long-term studies.
The appointment of Colonel was given in 1995.
Mr Dahlberg lives together with Carin Frisk since 1998. They live in the neighbourhood of Stockholm and share the interests of outdoor and cultural activities.

APPENDIX 1.10 Meeting notes 2002-02-06 AgNano meeting #7

FM Nanoteknik initiativ

Mötesanteckningar, AgNano möte #7

Datum: 2002-02-06

Plats: FOI Linköping, D1.143

Närvarande:Hans-Ove Görtz (HOG)
Anders Callenås (AC) (from 1000)
Hans Norinder (HN)
Steven Savage SJS)
Sören Svensson (SS)

Tid: 0930-1400

Previous meeting notes
SJS regrets omitting a matrix sent by HN, which could be useful later in assigning priorities. This is attached (Appendix 1)

Nanotechnology seminar day, 14 March.
The invitation and program were modified. The latest version is attached (Appendix 2).
The “offert” was discussed briefly, and accepted without change.
We need to work on the distribution list. I plan to mail out invitations as soon as possible, and at latest by the end of next week. I am trying to coordinate the lists we have here, if you think of any person or company, etc who you think should be invited please send me the details as soon as possible. I will circulate the list by e-mail as soon as possible next week. I will also confirm the lecturers.
The “Nanoteknik i försvarstillämpningar” home page is progressing, the first use for this will be to advertise the seminar day. We plan for the home page to “go public” at the end of next week.

We discussed ways of increasing contact with Vinnova, SSF and other similar authorities. HOG offered to write a letter, but needs the name and addresses of contact persons. HN promised to identify a suitable contact at Vinnova. Also, AC mentioned Rolf Arremark recently had contact with Vinnova, and can probably help with the name of a contact person. A suitable person at IVA could be Bengt Mölleryd (IVA, Box 5073, 102 42 Stockholm). I will try to identify a suitable contact at SSF.

USA visit travel report
We discussed our experiences and ideas received during the visits in USA. I will complete a draft of the travel report and distribute for comment as soon as possible, at latest by Wednesday next week.

UK study visit

We discussed the possibility of making a study visit to the UK (suggested by RD during USA visit). AC agreed to contact Hans Lok, coordinator for FOI's contacts with the UK. This has been done, and by coincidence Hans Lok will visit his contact at the UK MoD next week. I have given him some background information on the Swedish nanotechnology program which he will use during the visit. The objective is to identify a PoC in the UK nanotechnology program (or equivalent).

Nanotechnology workshop, 16-17 May

We discussed the upcoming workshop. A new organisation and steering of the program was discussed. See Appendix 3. Regarding the costs of administering the Fotonik program, Mikael Lindgren estimated about 2 MSEK for the program over 3 years (including the costs for the reference group). Note this is only an estimated figure, but agrees reasonably well with our own estimate of about 500 kkr/year.
A question was raised about payments to foreign defence employees who may be invited to be part of the reference group. How can this be done? I will contact Fotonik programmet and ask, they have experience of this.
The original plan for the workshop was reworked. The new plan is given in Appendix 4.
We discussed inviting Generallöjtnant Johan Kihl to make the opening presentation. HOG agreed to investigate if this is possible.
We discussed various invited speakers, including Prof Peter Dobson (Oxford University, UK), Prof Richard Siegel (Rensselaer Polytechnic Institute, USA), someone from industry, e g from NFFP (who?) and maybe Dr Gernot Pomrenke (USAF) whom we met in the USA.
Our discussions were partly inspired by preliminary ideas for the workshop, including reduced maintainance costs (important in all military systems), low observables and protection against B and C weapons.
We discussed having one invited speaker at the beginning of the workshop, to stimulate thoughts and discussion, and another speaker to close to the workshop, to round off. No decisions were made.

Long term FoT plans

While in the USA RD suggested discussing the FoT plan in a longer time perspective (at least, that's what I thought was meant). We discussed this briefly, especially in terms of what we learnt in the USA (some of the US DoD laboratories spoke of a 30 year time horizon). This seems to be a good idea, but the group needs to be complete. I suggest we take this up again at the next meeting.

Next meeting 7 March, where we will discuss the final details for the seminar day. A list of the meetings planned until the end of the 2nd quarter, and their locations is given in Appendix 5.

At the keyboard,

Steven J. Savage

Appendix 1.10.1 HNs suggested matrix, which could be useful in assigning priorities later (matrix is not complete yet)

	Kolrör	Partikelarmering	Hårda skikt	Elektronik minitariserin g	Renare, finpartiklmaterial, homogenare				
Fotonik									
Konventionell robot									
HVM									
Telekrig									
Stridsdel									
Ballistiskt skydd									
Ledning									
Samband									
Beslutstöd									
Hantering stora infomängder									
Säker kommunikation									
Rörlighet									
Enskild soldat									
Plattform									
UAV									
Energiteknik									
Bränslecell Strömkälla									
Sensorer									
ljus/mörker									
Ljud/mikrofon									
Lukt									
Vibrationer									
Sändare buren									
Verkan spängkraft									
RSV sprängmedel									
RSV kon liner									

Appendix 1.10.2 Inbjudan till seminarium: Försvarsorienterad nanoteknik

Försvarsmakten planerar en tillämpningsinriktad FoU-satsning på nanoteknik-området. Med nanoteknik menas här att utforma material och strukturer på nanometernivån. Startdatum beräknas till januari 2003. Programmet kommer att läggas upp i samverkan mellan olika intressenter och aktörer inom myndigheter, UoH och industri. Det förväntas innehålla en bred bas för både civila och militära tillämpningar med utvecklingsmöjligheter för båda dessa områden. Intentionen är att FoU-satsningar från försvaret och övriga samhällssektorer ska kunna integreras. Vi kan då snabbare nå intressanta tillämpningar. Försvarets del i denna satsning kan komma att uppgå till 100 miljoner kr under en femårsperiod. Diskussioner om programmets inriktning och innehåll inleds med en workshop under maj månad. Seminariet utgör en första grund för det fortsatta arbetet.

På uppdrag av Försvarsmakten inbjuder FMV och FOI till ett seminarium om nanoteknik. Meningen med detta seminarium är att alla intressenter ska ha en gemensam bakgrund inför workshopen.

Seminariet anordnas den 14 mars i FOI:s lokaler, Linköping och är kostnadsfritt. Antalet deltagare är begränsat till 40, deltagande kan därför inte garanteras. Av administrativa skäl tas det ut en avgift på 1000 kr av bekräftade deltagare som uteblir. Avbokning ska ske före 11 mars. En vägbeskrivning och ytterligare information skickas tillsammans med deltagarbekräftelsen. Anmälan och eventuella frågor ställs senast 28 februari till nano@foi.se eller 013-37 81 11.

Program 14 mars 2002

0900-0930	Registrering, utdelning av dokumentation, m m
0930-0945	Välkomsttal. Avdelningschef Svante Ödman, FOI
0945-1030	Försvarets nanoteknikprogram. Övlt Hans-Ove Görtz, Hkv
1030-1045	Paus
1045-1145	Överblick: Vad är nanoteknik? Doc Steven Savage, FOI
1145-1245	Lunch
1245-1345	Industriella tillämpningar för nanostrukturella material. Doc. Olle Grinder, PM Technology AB
1345-1400	Paus
1400-1430	Nanoteknik i sensortillämpningar. Tekn dr Eva Hedborg-Karlsson, FOI
1430-1500	Signaturegenskaper hos nanomaterial. Tekn dr Hans Kariis, FOI
1500-1515	Paus
1515-1545	Nanokompositer i försvarstillämpningar. Prof Ulf Gedde, KTH
1545-1615	Mekaniska egenskaper hos nanostrukturella material. Doc Michael Jacob, FOI
1615-1645	Nanoteknik mot kemiska och biologiska stridsmedel. Tekn dr Torbjörn Tjärnhage, FOI
1645-1700	Internationella aktiviteter, USA, EU, m m. Doc Steven Savage, FOI

Appendix 1.10.3 Organisation of the nanotechnology program (version 2)

2002-02-06

Estimated cost: 500 kkr/yr

Steering + Management group (combined, but with two functions). Probably about 15 persons in all.

1) Steering function, i e administration, financial and following-up About 5 persons, not PL's. E g Hkv, FMV, Vinnova/SSF/Vetenskapsrådet/IVA, FOI, industry

2) Management function, i e, planning, prioritizing, etc (steering group + PL's)

Reference group 5-6 members, task is scientific advice, quality assurance, relevance, etc. Members will be scientific experts, foreign and Swedish.

Project groups, decided by the respective PL's.

Appendix 1.10.4 Revised program for the workshop (version 2)

2002-02-06

Still only preliminary

Dates: 16-17 May 2002
Location: Eurostop hotel, Märsta
Numbers: 60 rooms booked
Cost: circa 1500 kr/person (incl room + board)

Suggestions for invited speakers:
Generallöjtnant Johan Kihl
Prof Peter Dobson, University of Oxford, UK
Someone from SSF or IVA
Someone from Swedish defence industry, e g from NFFP
Someone from US DoD, e g Dr Gernot Pomrenke, USAF
Prof Richard Siegel, Rensselaer Polytechnic Institute, USA

Program

16 May
1000 Start: introduction, organisation, objectives, etc, first invited speaker.
1200 Lunch
1201 Working discussions
2000 Dinner

17 May
0900 Continued working discussions, proposals produced
1100 Lunch (chairs prepare overview of group results)
1230 Presentation of results
1400 Final invited speaker?

Appendix 1.10.5 Outline AgNano activity plan 2002-01-01—2002-06-30

Date	Time	Location	Comments
16 Jan	1000-1200	FMV Tyresö	AgNano meeting #6 Final planning before USA trip. What do we expect to learn? What questions do we need answered?
22-30 Jan		USA	Study visits
6 Feb	0930-1430	FOI Lin	AgNano meeting #7 Summary after USA trip. What did we learn? Continued planning for workshop Finalise “nanoteknik för försvarsindustri” course invitation
7 March	1000-1200	FMV Steninge	AgNano meeting #8
Week 11		FOI Lin	Course “nanoteknik för försvarsindustri”
19 March			Deadline, preliminary proposals from industry
21 March	1000-1200	FMV Steninge	AgNano meeting #9 Sort/discuss proposals received
4 April	1000-1200	FMV Steninge	AgNano meeting #10
18 April	1000-1200	FMV Steninge	AgNano meeting #11
7 May	1000-1200	FMV Steninge	AgNano meeting #12
16/17 May	All day	Eurostop/Märsta	Nanoteknik workshop
30 May	All day 1000-1600	FMV Steninge	AgNano meeting #13 Evaluation of workshop results
14 June	1000-1400	FMV Ulriksdal	AgNano meeting #14 Discussion of report
30 June			Report deadline

APPENDIX 1.11 Meeting notes 2002-03-07 AgNano meeting #8

FM Nanoteknik initiativ

Mötesanteckningar, AgNano möte #8

Datum: 2002-03-07

Plats: FMV, Steninge

Närvarande:Hans-Ove Görtz (HOG)
Rolf Dahlberg (RD)
Anders Callenås (AC)
Hans Norinder (HN)
Sören Svensson (SS)

Tid: 1015-1215

Previous meeting notes

No comments, SJS apologises for being late with the draft of our travel report (circulated on 020305)

Travel report

No immediate comments. A new version, including summary was circulated yesterday evening (020307). We agreed to keep this as “arbetsmaterial” for the time being, so that it will not be open. It may be registered as a report later, or used in summary form. We agreed to send this (with some parts omitted) to ONR in London (marked “confidential”) to thank them for assistance in setting up the visits. Please send any comments on the report and distribution list to SJS as soon as possible. Distribution limited to AgNano.

HOG reported that two Japanese companies are approved to receive secret information regarding information exchange on composite materials (unclear if this applied to signature properties, but probably not).

HOG reported that budget planning for the nanotechnology program is on schedule, 100 Mkr is budgeted in three phases. Schedule still OK to start in ’03.

HOG will visit Saab in Linköping on 11 April, and has requested a review of their interest in nanotechnology.

RD reported he may attend a conference on battery technology in Washington (Rolf, can you circulate the details please?).

Planning for the nanotechnology seminar day (18 March) is continuing. About 20 persons are registered (list attached). This is disappointing. SJS will try to call some persons directly. Missing are:
Hägglunds

Volvo Flygmotor
Sicomp
Nanoprodukter
Karolinska Inst
Bofors defence
Scania
Kockums
ABB
Åkers
Vinnova
Uniform supplier (who?)

HOG cannot attend, RD will speak on the nanotechnology program instead. Otherwise, all AgNano are registered, plus Carina Wijkander-Björk (FMV).

Re. Vinnova (HOG agreed earlier to write letter), we will await the result of a meeting RD will have next week. It is important to identify the correct contact person.

WEAG/CEPA group meeting on nanotechnology, SJS will attend (program attached). Try to make contact with Jones (from DERA), he could be useful contact to make study visit to UK.

AC will contact Hans Lok again re possible study visit to UK.

RD requested we increase AgNano to include Michael Jacob (FOI Grindsjön). Torbjörn Tjärnhage (FOI Umeå) is already a member, but has not attended a meeting yet. SJS will ask him to attend. This will improve the balance of the group. (Note, this will increase the time put into the project by FOI by an estimated 4 weeks during the rest of this year. This is a conservative estimate. How do we finance this?).

When we have a good contact at Vinnova that person should also be invited to the group.

SJS informed about interest in THz electronics from USA (this may be why the US interest in nanoelectronics was so visible during our study visit) Applications in radar, communication, imaging. The US is trying to establish a technology gap for secure, jamming-free communication. Lund university will receive $1.5 million/year for a program on nanostructures.

Regarding long term efforts within FoT 18 (materialteknik) SJS suggests an issue of “FOI orientera om” to increase the awareness of material technology. AC says this will cost about 2 Mkr. He will raise the matter with ?? In general we can say that efforts to raise the awareness of materials technology have not met with much success.

SJS: the web site www.nano.foi.se is now operational. For access to the members section (should be available next week) the user name is AgNano, password m3mb3rs.

We need to reschedule our meetings for the rest of the year. This will be done at the next meeting (21 March).

SJS needs a budget for the planned workshop as soon as possible. Administrativstöd is difficult to find at FOI, therefore we must be able to show there is financing available to hire external services when essential. SJS will prepare an estimate as soon as possible. We may need to charge for the workshop, instead of offering it gratis.

Registered for nanotechnology seminars (as of 020306)

Martin Borgh	FMV KC Farkost
C-G Ribbing	Uppsala univ
Pontus Nordin	Saab Lin
Christina Wahlström	Saab
Lars Olsson	
Johan Sowa	
Sven Komstadious	
Jan-Olov Genberg	
Jan Andersson	Acreo
Johan Norén	Ericsson Microwave Systems (Göteborg)
Ola Dickman	FMV
Mats Eklund	Applied Composites
Rolf Falk	Saab Vetronics
Peter Edman	Saab Barracuda
Martin Stålfors	Saab Vetronics
Peter Alberius	Ytkemiska institutet
Håkan Persson	CSM Materialteknik
Anders Sjölund	SSF
Leif Tranell	Saab Bofors Dynamics

APPENDIX 1.12 Meeting notes 2002-03-21 AgNano meeting #9

Mötesanteckningar från AgNano möte #9

Datum: 2002-03-21
Plats: FMV-Steninge
Tid: 1015-ca 1315

Närvarande:
Anders Callenås (AC)
Rolf Dahlberg (RD)
Hans-Ove Görtz (HOG)
Michael Jacob (MJ)
Hans Norinder (HN)
Steven Savage (SJS)

Förhindrade:
Sören Svensson (SS)
Torbjörn Tjärnhage (TT)

- HOG och MJ presenterad sig för varan.
- Kommentar från senaste mötesanteckningar: RD fundera att delta i en konferens (i Washington) om bränslecell teknik, inte batteriteknik - SJS beklagar felet.
- RD rekommenderar HN att titta närmare på en mässa om bränslecell teknik som ska hållas i Hannover, med avsikt att ev. delta i mässan.
- Reflektioner om genomförda nanoteknik seminariedagen. Alla verka ganska nöjda, ev. kunde vi har blivit mer tydlig om vad som önskas av deltagarna när det gäller projektförslag (denna kritik ska beaktas i kommande inbjudan till workshopen). SJS saknade några viktig företag. Även deltagande från UoH var klent.
- Workshopen

Budget för workshopen (ej inplanerade i nuvarande FM beställningen) diskuterades. Om FM står för hela kostnaden krävs ca 200 kkr. Budget förslag bifogas (bilaga 1)
Beslutade att HOG och AC omförhandla beställningen, tillägg 200 kkr.
Beslutade att: genomföra workshopen, 16/17 maj, på Eurostop hotell/Arlandastad, 60 rum, 60-75 deltagare (max), FM bjuder på logi/mat och själva workshopen, dokumentation, m m.
Vi diskuterade andra alternativ till Eurostop, t ex Swedint i Södertälje, och Näsby Park, men beslutade att stanna vid Eurostop.
Beslutade att **inte** har några inbjudna föredragshållare denna gång, ev. är detta lämplig senare, t ex vid ett ev. andra workshop.
Vi diskuterade vikten av att inbjudan till workshopen bör ger insikt in i FM:s visioner, strategi, handlingsplan, tidtabell, m m. Se bifogade korta anteckningar (bilaga 2).
Tidtabellen för AgNano:s olika aktiviteter mellan nu och sista juni diskuterades. Vi enades om planen som bifogas (bilaga 3), som även innehåller aktiviteter kring workshopen.
Beslutade att inkommen förslag behandlas konfidentiellt, distribueras bara inom AgNano. Detta ska står in inbjudan.

- **Beslutade** att senarelägga ett ev. studiebesök till Storbritannien och/eller Tyskland, dock undersöks vilken möjligheter som finns. SJS kollar men Alan Pritchard, RD kollar med ? på FMV, AC kollar (igen) med Hans Lok på FOI. Övriga kontaktpersoner välkomnas.
- RD nämnde möjligheten att i framtiden och tillsammans med ? (Tyskland) anordna ett TP workshop angående nanoteknik. Samma görs nu kring fotonik.

Att göra!

Vem?	Vad?	Deadline
HN	Kolla Hannover mässa om bränslecell teknik	Snarast
HOG, AC	Omförhandla FM beställning, tillägg 200 kkr för genomförande av workshopen	Snarast
SJS	Skicka till AgNano utkast till inbjudan/sändlistan	25/5
Alla, särskilt HN och SJS	Komplettera/korrigera utkast till inbjudan och sändlistan. OBS FMV har huvudansvar för industrideltagande (HN sammanhållande), FOI har huvudansvar för UoH deltagande (SJS sammanhållande)	26/5
RD	Kolla med ? angående ett ev. studiebesök till Tyskland	Nästa mötet 22/4
AC	Kolla med Hans Lok angående ett ev. studiebesök till Storbritannien	Nästa mötet 22/4
SJS	Kolla med Alan Pritchard angående ett ev. studiebesök till Storbritannien	Nästa mötet 22/4

Appendix 1.12.1 Preliminär budget för nanoteknik workshopen 16/17 maj.

Bilaga 1

Plats: Eurostop hotell, Arlandastad

Logi + mat 1233/pers x 60	73980		
(logi 618, mat m m 615)			
Konf. Lokaler	18200		
(1sal för 60 pers, 3 grupprum för 10 pers)			
Dokumentation 60 á 200	12000		
Administrativ stöd 60 tim á 600		36000	
(inbjudan, sändlistan, anmälningar, m m)			
Organisation av workshopen (24 tim á 950)		22800	
		73980	89000
			162980

Appendix 1.12.2 Anteckningar angående inbjudan till workshopen
Bilaga 2
Detta är bara punkterna Rolf skrev ner under mötet i dag. Det är viktig att inbjudan ger insikt in i workshopens syfte, mål och genomförande, samt lockar till deltagande.

Tanken är att inbjudan skickas ut redan onsdag nästa vecka, alltså det är bråttom att fundera på innehållet i inbjudan och sändlistan.

Jag återkommer med en mer detaljerade skrivelse, samt förslag till sändlistan på måndag.

Inbjudan
- FM, FMV och FOI inbjuder till en workshop om nanoteknik i försvarstillämpningar
- Inbjuder att lämna förslag på projekt i ett framtida nanoteknik program

Workshopens syfte och genomförande i stort
- Ej beslutstillfälle, med möjligheten att lämna underlag

FM utgångspunkter och mål
Praktiska anvisningar kring workshopen (datum, plats, tider, kostnader, m m)
Ekonomin (workshopen)
Förslagen (behandlas som konfidentiellt inom förberedelse gruppen bestående av FM, FMV och FOI bara) sänds till FOI, attn Steven Savage senaste 15/4. Förslag (gärna en A4 sida) ska innehålla vision, strategi, handlingsplan.
Slutlig agenda för workshopen skickas ut tillsammans med om bekräftelse deltagande förste veckan i maj.
Preliminär anmälan om deltagande i workshopen önskas senaste 15/4 (ange speciella önskemål om mat, rum, m m)
Slutlig anmälan kommer med agenda utskick

Appendix 1.12.3 Aktivitetsplan t o m sista juli
Bilaga 3 (uppdaterat 020417)

Vecka	Datum	Aktivitet
13	25/3	Utkast till workshop inbjudan skickas av SJS till AgNano för kommentar/tillägg
	25/3	Utkast till sändlistan skickas av SJS till AgNano för kompletterande
	26/3	Kommentarer och tillägg om ovan skickas tillbaka. Inbjudan färdigställs, och skickas ut för slutgiltig kommentar
	27/3	SJS skickar ut första omgång av inbjudningar
	Löpande	Sändlista kompletteras, nya inbjudan skickas ut allt eftersom
16	15/4	”deadline” för preliminära projektförslag samt preliminär anmälan till workshopen
17	22/4	AgNano möte #10. FMV, 1015-1700. Lokal K232. Syfte. Diskussioner kring inkommen preliminära projektförslagen, grupperingar av sådana, saknas det något/någon? Beslut om åtgärder i så fall.
18	3/5	Bekräftelse om deltagande i, samt agenda för workshopen skickas ut.
19	7/5	AgNano möte #11. FMV 1015-1215. Lokal: Steninge. Förberedelser inför workshopen görs färdig
20	16-17/5	FM Nanoteknik i förstillämpningar workshop genomförs
22	31/5	AgNano möte #12. Lokal F2 Genomgång/analys/ sammanfattning av resultaten från workshopen. FMV 0900-1500
26	28/6	AgNano möte #13. Lokal Ulriksdal Slutgiltig arbete med milstolpen första halvåret. FMV 1015-1215.

APPENDIX 1.13 Meeting notes 2002-04-22 AgNano meeting #10

FM Nanoteknik initiativ

Mötesanteckningar, AgNano möte #10

Datum: 2002-04-22

Plats: FMV, K232

Närvarande: Hans-Ove Görtz (HOG)
Anders Callenås (AC)
Michael Jacob (until ca 1130)
Hans Norinder (HN)
Steven Savage (SJS)

Apologies received from: Rolf Dahlberg (RD); Sören Svensson (SS) and Torbjörn Tjärnhage (TT)

Tid: 1015-1730

No comments on previous meeting notes.
Before commencing the main business of the day (sorting project proposals) some short, “other business” questions were taken up.
Participation of SJS (and MJ, TT) in the planning group and as applicants for funds from the nanotechnology program may lead to questions of bias. A similar question arose earlier in the “fotonik” program. The problem was solved using common sense at the appropriate times. We do not have enough people to avoid the problem entirely, but should minimise this as much as possible.
It was agreed that AgNano will meet the evening before the planning workshop, and sleep over at Eurostop hotel. Rooms are reserved for HOG, AC, HN, SJS, RD, SS and MJ (SJS is trying to contact TT).
SJS will try to produce a poster describing the program in time for the workshop. (Note, if possible circulate this before finalising and printing).
It is important to coordinate with Vinnova and SSF. MJ will try to locate a good contact person. (SJS received information from Staffan Rudner that Jan Söderkvist is the correct person. Jan is away until 6 May).
We need an administrator to help during the conference, especially someone with knowledge of computers, etc. SJS has spoken to Mathz Hjalmarsson, who helps with FOI’s courses in Linköping. He will be in Stockholm on 16 May for another errand, and could probably join us in the evening. This might be convenient, since most of the writing will be done on Friday 17th.
It is OK for non-Swedish citizens to participate in the workshop.

We discussed a preliminary program for the workshop (see Appendix 1)

About 100 project proposals have been received, which is more than expected. How do we handle this? First separate them into categories (e.g. SAT, mechanical properties, optical properties, aerospace, etc.). We started to do this, and managed

to sort more than half before we closed the meeting. SJS will finish the sorting, and send the results for further analysis and comments from AgNano. (see appendix 2)
The groups we decided on were:
1. Sensorer
2. Kommunikation
3. Information hantering
4. SAT
5. B/C skydd
6. Fysisk skydd
7. El energi
8. Flerfunktionella material
9. Otydlig tillämpning
samt ej lämplig för programmet (d v s avslås direkt)

We agreed that it is reasonable to fund 10-15 projects during phase I of the programme, reducing this to 4-7 projects during phase II.
It is reasonable to present about 20 proposals during the workshop (15 minutes/project, total time 5 hours)

The possibility of a study visit to England was briefly discussed, but nothing decided. SJS plans to attend the Farnborough aerospace exhibition (July 2002), and could at that time visit Prof Richard Jones, responsible for nanotechnology at DSTL. He is working under Doug ? (I forget his name) at MoD.

For about 1 hour the meeting was attended by Bo Tarras-Wahlberg (FOI) and K-G Lövstrand (FMV) who presented the new FoT strategy, which is now the driving force behind the future development of FM in Sweden. In particular the ”särskilda program” type of funding was presented, since the nanotechnology initiative is in this category. Important is that these are generic programmes, influencing many FoT areas, and often have significant dual-use character, opening the possibility for joint funding with civilian bodies such as Vinnova, SSF, Vetenskapsrådet, etc.

A number of the challenges the defence organisations face in the future include:
Operativ utmaningar
- Information och omvärldsutveckling
- Dynamisk ledning
- Logistik
- Insatsanpassat skydd

Skapa anpassningsförmåga
Internationellisering
Civil teknik
Nätverksbaserad försvar

It was noted that the new FoT strategy has not yet been circulated, but AgNano will receive copies when it is published (maybe we can receive this by e-post from KGL before the paper copies are printed).
Bo Tarras-Wahlberg may attend AgNano meeting on 28 June (for a short time).

Appendix 1.13.1 Preliminär programmet

Bilaga 1

Torsdag den 16 Maj

0930	ankomst, registrering, utdelning av namnbrickor (?) m m
1000-1030	Inledning, av Hans-Ove Görtz (not 1)
1030-1100	Uppläggning av workshopen, arbetsgrupperna, syften, avrapportering, m m (not 2)
1100-1130	Gruppindelning (not 3)
1130-1200	Grupperna “sammankallas” och börjar lär känna varan (“networking”)
1200-1300	Lunch
1300-1500	Grupperna arbetar med förslagen (not 4)
1500	Paus
1500-1900	Fortsatt grupparbete
2000	Middag

Fredag den 17 Maj

0900-1100	Fortsatt grupparbete (not 5)
1100-1200	Lunch
1200-1500	Återsamling av alla samt presentation av gruppernas slutsatser (not 6)
1500	Avslutning och hemresan

Några kommentar
1. HOG inleder med presentation av FM:s nanoteknik program, tidsplanen, ekonomiska förutsättningar, samordning med civila finansiärer, m m.
2. Det är viktig att arbetsgrupperna vet vad de ska göra, d v s tar fram ca 3-4 förslag per grupp (utifrån de inkomna förslag) som ska presenteras innan workshopen är slut.
3. Det är fritt att byta om någon tycker deras förslag passa bättre i en annan grupp an vad är tilldelad.
4. I varje grupp ska finnas någon från beredningsgruppen (d v s AgNano) för att garantera alla kommer till tals.
5. Grupperna kommer att krävas en redovisning på fredag e m samt förnyad skriftlig förslag inom 2 veckor, d v s slutet av maj. Det bör påpekas att detta är en sträng deadline, till skillnad från tidigare! Det ska ordnas minst en dator/grupp så att de preliminära förslag kan skrivas och överlämnas till AgNano på plats innan alla åker hem. Även en skrivare bör kunna ordnas. Varje grupp disponerar ca 30 minuter för presentationen (d v s ca 10 min/förslag). Presentationen ska innehålla: inledning, vision, strategi och genomförandeplan.
6. Ett antal frågor måste besvaras i varje ny förslag, enligt följande matris.

Om vi kan få 3-4 projektförslag/grupp gånger 6 grupper har vi max 24 projektförslag att ta ställning till.

”Mall” för förslagen som arbetsgrupperna ska använda.

	Förslag 1	Förslag 2	Förslag 3	Förslag 4
Behov, d v s vilken nytta kommer FM att vinna om projektet genomförs?				
Vem deltar i projektet, d v s vilken partners ingår?				
Internationellt samarbete?				
Tidsramen				
Möjligheten för ändra finansiärer att dela på kostnaden? T ex UoH, industri Vinnova, SSF, EU				
Ungefärlig storlek på projektet				

APPENDIX 1.12 Meeting notes 2002-05-07 AgNano meeting #11

FM Nanoteknik initiativ

Mötesanteckningar, AgNano möte #11

Datum: 2002-05-07

Plats: FMV, Steninge

Närvarande: Hans-Ove Görtz (HOG)
Anders Callenås (AC)
Michael Jacob (MJ)
Hans Norinder (HN)
Steven Savage (SJS)
Rolf Dahlberg (RD)
Apologies received from: Sören Svensson (SS) and Torbjörn Tjärnhage (TT)

Tid: 1015-1215

No comments on previous meeting (#10) notes.

The main topic of this meeting was final preparations for the up-coming workshop.

It was decided that the role of AgNano members during the workshop should be that of chairman for each group (this idea had been discussed previously). The groups were decided as follows.

Group nr	Area	Chairman
1	Sensors	Anders Callenås
2	Elektronics/communication	Rolf Dahlberg
4	SAT	Sörev Svensson/Hans-Ove Görtz
5	B/C detection/protection	Torbjörn Tjärnhage
6	Structural materials	Michael Jacob
8	Multifunctional materials	Steven Savage/Hans Norinder

The preliminary workshop program previously discussed was agreed on. Any unforseen events occuring during the workshop will be solved as they occur. An extra group room is needed as we have six groups and only five rooms. SJS will arrange.

We agreed that HOG would open the workshop, and make an introductory presentation, after which RD would describe in more detail the ”philosophy” of the programme being planned, the broad start (Phase 1) focussing more closely on a smaller number of projects during the second phase.

We discussed various factors considered important in the evaluation of project applications, including the value (”usefulness”) for defence applications, costs, timeframe, plausibility, networking, etc. (without actually coming to any firm conclusions)

We agreed to meet at Eurostop hotel at about 1700, and to make final preparations in the evening before the workshop.

APPENDIX 1.15 Meeting notes 2002-05-31 AgNano meeting #12

FM Nanoteknik initiativ

Mötesanteckningar, AgNano möte #12

Datum: 2002-05-31

Plats: FMV Tre Vapen, rum F2

Närvarande: Anders Callenås (AC) until 1215
Rolf Dahlberg (RD)
Michael Jacob (MJ)
Hans Norinder (HN)
Steven Savage (SJS)
Sören Svensson (SS)
Torbjörn Tjärnhage (TT) from 0930
Apologies received from: Hans-Ove Görtz (HOG)

Tid: 0900-1330

No comments on previous meeting (#11) notes.

Comments re the recent workshop. SJS was a little disappointed that we did not summarise the group activities in a more complete way. We still do not have a complete overview of all the project ideas received. However, everyone seems to feel the workshop was well organised and interesting. Undoubtably several seeds of cooperation have been sown, which was also one of the main objectives of the workshop.

The ”enbladare” and letter to workshop participants was discussed. Updated versions of these documents are appended (Appendix 1). We decided these should be combined into *one* file.

Several companies should be made aware of the nanotechnology program, including ABB, Åkers Protection (Lars Sjöö) and Ericsson Microwaves (Lars ???). No proposal(s) received yet from Åkers or Henrik Östmark (FOI), although both have indicated their intention to submit ideas. We did not decide who should make contact, but we have previously agreed FMV will coordinate with industry, so I suggest HN contact these companies. I would like to ask MJ to contact Henrik Östmark.

We discussed and agreed on priorities regarding ”värderingsgrunder.” The revised priorities are appended (Appendix 2).

We discussed ”svarta projekt”, i.e. secret projects. We did not come to any conclusion as to how to handle these, but the need is not likely to arise before Phase II of the nanotechnology program. One suggestion is to finance these from other sources, another to direct funds from the program to this purpose. Clearly it is a good idea to discuss this before the need arises, which it may well do when projects close to defence applications are being considered. (I have checked this with Mikael

Lindgren from the fotonik program. *That program has decided not to approve any secret projects.* Confidentiality required due to e.g. patent applications – intellectual property rights, IPR is regulated in the document ”Tjänst 95”).

The meeting planned for 28 June is cancelled. This was only to approve the milepost delivery required before the end of June. At the suggestion of RD this will be in the form of a simpler ”FOI Memo” document. I will circulate a draft of this before week 25.

The next meeting of AgNano was decided for 16 August, in filmsal C, FMV (in the cellar of C house). Time 0900-1500. This meeting will be devoted to reviewing all the project ideas received, and deciding which to select for further evaluation and which to reject. We will use the priorities given in appendix 2 to motivate our decisions. All project ideas will be reviewed by all members of AgNano, but each group chairman (from the workshop) has a special responsibility for those projects presented in his group.

The function and purpose of the program web site www.nano.foi.se was discussed. We agreed only the ”enbladare” should be published there, nothing from the meetings of AgNano. I will continue to distribute these via e-post until further notice. The future purpose of the web site is not decided, so no further information will be made available via this channel until the matter is clarified. We agreed to discus this matter at a later meeting. The site will however be updated to reflect changes due after the recent workshop.

We discussed briefly the need for a scientific review committee (referensgrupp). This is essential to enable joint funding with SSF, Vinnova, etc. Such a group should receive travel funds but nothing for their time (we assume they will accept the time costs for their own interests).

We discussed joint financing with SSF, Vinnoa and similar civil organisations. We should arrange a meeting with representatives sometime after the summer (undecided when) and arrange for K-G Lövstrand to participate.

We discussed the need for another workshop. Possible dates are 17-18 October, in Linköping (I have checked availability of FOI’s conference centre. These dates are NOT available. The entire week before (week 41) is NOT available. Week 43 (21-25 Oct) I have provisionally booked one room (seats 20 pers) and 3 group rooms (seat 8-10 pers each). The workshop could take the form of a few small groups meeting on one day (with the whole of AgNano present) followed by dinner. On the second day other groups could be arranged, again with the whole of AgNano. In this way the need for larger meeting rooms is avoided, and all members of AgNano can hear everything discussed in all the groups.

A plan for AgNano’s activities from July to December was discussed, but only a possible workshop was in any detail.

We discussed a budget for planning activities during July-December 2002. (SJS had previously distributed a proposed budget). FMV has suggested an additional 650 kkr for FOI’s activities until the end of the year. SJS will prepare an accurate budget calculation and circulate this to FOI members of AgNano. We need to be certain that

the activity plan matches the economic plan! SJS noted the risk that the recent workshop cost more than the budget.

Torbjörn Tjärnhage will resign from AgNano at the next meeting, and will be replaced by Lars Österlund (both will attend the next meeting if possible).

SJS informed the planning group about:
Nanonet, a further business network, which claims to be carrying out a survey of nanotechnology R & D in Scandinavia. (www.eidena.com)
Conferences: Nano 2002, June 16-21, Orlando, Florida. SJS will attend
Nano 7/ECOSS 21, June 24-28, Malmö
Nano Chemistry, 26-27 August, Stockholm archipelago, arranged by SSF 3rd workshop on Nanochemistry and nanobiotechnology
”Nanospace” 8-13 Sept, Texas. (http://wwwnanospace.org)
Coordination between FM nanotechnology programme and SSF, Vinnova, etc. Peer review required.

SJS was requested to draft en preliminary activity plan for July-December, and attach to the minutes of this meeting. (To save time I will do this later)

Appendix 1.15.1 Letter plus mall
Appendix 1.15.2 Värderingsgrunder
Appendix 1.15.3 Förslag till aktivitetsplan juli-dec 2002. (will be sent later)

Appendix 1.15.1 Brev

FOI
TOTALFÖRSVARETS FORSKNINGSINSTITUT

2002-06-03

Bästa kollega!
Som utlovades vid Försvarsmaktens nanoteknikprograms planeringsworkshop som genomfördes 16-17 maj, återkommer jag med ytterligare information angående planeringsläget, planerade aktiviteter under hösten 2002 samt viss kompletterande information.

Flertalet deltagare upplevde workshopen som relevant, intressant och givande. Denna slutsats drar vi från kommentarerna vi fått efter genomförandet. Det gör att även vi i planeringsgruppen är nöjda, och vi tackar samtliga medverkande för väl genomförda insatser.

På grund av det stora antal inlämnade projektidéer valde vi av praktiska skäl att arbeta i parallella arbetsgrupper. Detta resulterade i begränsade möjligheter att diskutera med eventuella framtida samarbetspartners från andra grupper.

Alla tidigare inlämnade projektidéer betraktas som arbetspapper och kommer därför inte att spridas utanför planeringsgruppen. Men, under workshopen framkom önskemål om att kunna ta del av andras projektidéer, detta för att kunna hitta samarbetspartners och föra diskussioner mellan forskare och industrin. Det föreslogs att förslagsställarna skulle ta fram nya enkla, överblickbara och kortfattade beskrivningar av projektidéerna med kontaktuppgifter såsom namn, telefonnummer och e-post adress. Det föreslogs också att en kontaktlista med namn och kontaktuppgifter skulle upprättas, även detta för att underlätta nätverksbildning, en förutsättning för effektivt utnyttjande av våra olika kompetenser.

En standardiserad beskrivning ger oss alla fördelen att på ett enkelt sätt kunna överblicka det stora antal projektidéer vi har att arbeta med. Detta möjliggör också att de som inte kunde lämna projektförslag tidigare kan göra det nu. Vi planera att lägga ut dessa ”enbladare” på Nanoteknikprogrammets hemsida (www.nano.foi.se). Dessa beskrivningar kommer att vara lösenordsskyddade. Lösenordet delas ut till de i beskrivningen angivna kontaktpersonerna. Information som ni vill ha skyddad bör inte läggas in där. Information som ni vill delge planeringsgruppen men som ska inte läggas ut på webben skickas per post till undertecknad. Du få gärna ändra eller komplettera tidigare inlämnad projektidéer.

Var vänlig fyll i den bifogade blanketten och skicka den i retur till mig så fort som möjligt, helst per e-post. Mallen finns för nerladdning på www.nano.foi.se När flertalet svar har inkommit läggs dessa ut på sajten och en kontaktlista skapas. För Er som redan under workshopen fyllt i mallen (för hand) ber jag om överseende att ni ombeds fylla i en gång till.

Angående fortsatt planeringsaktiviteter: planeringsgruppen kommer att göra en prioritets bedömning av projektidéerna under perioden juli-augusti. Vi tar då hänsyn till i första hand följande bedömningskriterier: *nytta för försvaret; genomförbarhet; möjlighet att bilda/ ingå i nätverk; förmåga till nyttiggörande; och möjlighet till förnyelse sedd ur industri/materiel synvinkel.* Vi kommer senare att begär mer detaljerade projektförslag inför framtagning av vår rekommendationer för beviljande av projektmedel.

Tanken har väckts att det eventuellt finns behov av ytterligare en planeringsworkshop under hösten, dock i mer begränsat omfattning. Detta tar vi ställning till efter vi har sammanställt och prioriterat projektidéerna.

Om inte bifogade kortversion inlämnas utgår vi ifrån att ni har dragit tillbaka tidigare förslag/idé.

När det gäller nanoteknikprogrammets startdatum vill jag lämna ett förtydligande. Planeringsgruppen kommer att vara klart med sin rekommendation till årskiftet. Eftersom programmet hanteras utanför Försvarsmaktens ordinarie FoT-budgetramar måste Regeringen ge sitt godkännande innan programmet kan startas, som då beräknas till någon gång under första halvåret 2003.

Med vänlig hälsning

Steven Savage

Sändlista:
- Deltagarna i nanoteknik planeringsworkshopen 16-17 maj
- Tidigare förslagsställare
- Intresserade som inte haft möjlighet att delta i workshopen eller lämna förslag tidigare
- Medlemmarna i förstudie-/planeringsgruppen (AgNano)

Titel: (titeln används fortsättningsvis i korrespondens)
_____
Förslagsställare: (namn på person(er) och institution/företag/organisation bakom projektidéen. Om idén avser ett samarbete mellan ett antal olika organisationer stryk under den som är huvudman)
_____
Ursprunglig titel: (ev tidigare titel som använts för samma projektidé - för att underlätta spårbarhet)
_____
Projektinnehåll: (kortfattad beskrivning av projektidéens grunder, d v s vad ni vill åstadkomma när det gäller nanoteknikens möjligheter att framställa nya material, nya eller förbättrade materialegenskaper eller egenskapskombinationer, vad detta förutspås kunna leda till i försvarstillämpningar (var gärna specifik vad gäller detaljer, komponenter osv), vilka tekniker avses, nyckelteknologier, m m)
_____
Potentiella aktörer: (ange status, t ex identifierad, diskuterad, överenskommen, m m)
_____
Önskad medverkan: (önskemål om ev. medverkan från andra organisationer, saknad kompetens, saknade mätmöjligheter eller framställningsmöjligheter, m m)
_____
Potentiella medfinansiärer: (Ämnas medel sökas från ex. SSF, Vinnova, EU, företag, m fl?)
_____
Tidsram: (uppskattad tidsram du tycker krävs för att bevisa idéens bärighet. Ange gärna tiden uppdelat i olika etapper, t ex materialframställning, karakterisering, osv)
_____
Resurser: (behov av personal, utrustning, m m. Är dessa kostnader uppskattade, kalkylerade? Dela gärna upp i olika etapper.)
_____
Övriga uppgifter: (ytterligare information, kommentarer m m som du tror kan var värdefulla för värdering av projektet eller för övriga intresserade)
_____
Kontaktperson: (Viktigt! Denna person kommer fortsättningsvis att få all information rörande hanteringen av projektidén, och åtar sig att vidarebefordra till eventuella andra medverkande.)

Namn:	_____	***Företag, institution, högskola eller annan tillhörighet:***	_____
Postadress:			
Tfn:		***E-postadress:***	_____

Informationen på detta blad konverteras till pdf och läggs ut på www.nano.foi.se.
Mallen finns tillgänglig som pdf-fil samt Word-dokument på www.nano.foi.se

Den ifyllda mallen skickas snarast till steven.savage@foi.se

Appendix 1.15.2 Förslag till värderingsgrunder

Förslag till värderingsgrunder inför prioritering av projektidéer. Version 2. Vi bestämd bara prio 1 och 2 beaktas i en första vaderingsomgång

Idé/frågeställning
Här beskrivs kortfattat projektets idé och ev. frågeställningar för projektet.

Målbild
Projektets långsiktiga mål (ev. även delmål). Värdesätts efter hur tydlig målbilden beskrivs i projektberedning

1. Nytta för försvaret
Här beskrivs vilken långsiktig nytta försvaret (primärt ur FM, FMV och industrikompetens synpunkt, men även hela totalförsvaret) har av projektet under förutsättning att den kan uppnår förväntade resultat.

1. Genomförbarhet
Möjligheten att kunna genomföra projektet enligt plan (avseende kvalitet, kvantitet och tid)

2. Nätverk
Enligt projektberedaren möjligheter till att skapa nationella nätverk mot UoH, industri, FM, FMV, FOI, (FHS?) och internationella nätverk mot olika forskningsinstitut och högskolor.

2. Förmåga till nyttiggörande
Beskriver vilka(en) kompetenser som kan skapas – förnyas – behållas om projektet beviljas.

2. Förnyelse
Beskriver graden av ”förnyelse”

3. Anknytning till forskningstrender
Pågående forskning – nationellt och internationellt – som har relevant koppling till projektet (även försvarsforskning)

3. Kompletterande finansäring
Vilka(en) övriga finansiärer finns, och i vilka grad kan man dela på kostnaderna (ev uppdelat i olika etapper)

3. Tillämpningar
Vilka(en) konkreta tillämpningar kan projektet leda till? Hur relevant är de jämfört med försvarets behov av renovering/underhåll av befintliga system, eller uppbyggnad av kommande system, t ex YS Ny, HVM, helikopter, u-båtar, m m

Värderingsgrunder kan även poängsättas om så behövs, t ex på en skala 1 till 5.

Ev bör man begär kompletterande uppgifter från förslagsställaren om projektidéen verka bra men det saknas en del uppgifter (detta för att gör en rättvis bedömning)

APPENDIX 1.16 Meeting notes 2002-08-16 AgNano meeting #13

FM Nanoteknik initiativ

Mötesanteckningar, AgNano möte #13

Datum: 2002-08-16

Plats: FMV Tre Vapen, filmsal C

Närvarande: Anders Callenås (AC)
Hans-Ove Görtz (HOG) (f r m 1300)
Michael Jacob (MJ)
Hans Norinder (HN)
Steven Savage (SJS)
Sören Svensson (SS)
Torbjörn Tjärnhage (TT)
Lars Österlund (LÖ)

Tid: 0900-1630

Comments on previous meeting (#12) notes. Missing was some information on Defence Nanotechnology 2002 conference. This was taken up later in this meeting.

The new member of this group, Lars Österlund was introduced. He will replace Torbjörn Tjärnhage whom we thank for his contributions to date, and whom we hope will be able to continue to contribute ”in the background” and assist Lars.

Rolf Dahlberg has resigned from the group. We thank him for his valuable participation, and hope to be able to maintain contact.

An updated list of the planning group’s members and their contact coordinates is attached (appendix 1). I will continue to send information to Torbjörn Tjärnhage until further notice. Please check that your coordinates are correct.

We discussed our activity plan until the end of the year, and made some minor adjustments. See appendix 2.

Note, we have planned a new meeting on 30 August, but it is unlikely this will involve meeting Vinnova. HN is checking the status of this with Rolf Dahlberg. Answer expected by 21 August if possible,

Note, we suggest delaying the 23 August ”deadline” until we have met on 30/8.

Note, we have not decided that the workshop 22-23 october will take place, a decision on this is delayed until we have a better idea of the project proposals.

Note. The meeting planned for 22 november is changed to 21 november.

Reference committee. We agreed a reference committee is needed, probably of about six persons, and excluding all who receive funding from the programme (to avoid bias). In addition, a peer review group is needed of the final project proposals before final recommendations are made. This will require expert competence, and will depend on the content of the final projact proposals.

We discussed what material (underlag) is needed for FM to decide on the nanotechnology programme. The report we have previously discussed will be sufficient, it should contain recommendations and motivations as to the content of the programme, forecast on likely results and applications, the potential of nanotechnology, other financing possibilities, etc. This should be delivered by the end of the year. No other ”deliverables” are required at this stage.

It is likely that if FM decide to fund the programe this will be in two stages. Phase I, 40 MSEK and Phase II, 60 MSEK.

Re Defence Nanotechnology 2002 conference in London, those interested in attending are: AC, SS, SJS, maybe LÖ and HN. HOG and MJ will not attend. This could be combined with a visit to Qinetiq (Farnborough). SS has contact with Dough Burgess. Note to LÖ, HN, please confirm ASAP.

We discussed how to group the project ideas received, and agreed on the outline attached (appendix 3). This consists of 10 ”clusters” and one reserve. Each of the 82 project ideas was then discussed individually, and evaluated according to the priorities agreed upon at the previous meeting (attached, appendix 4 for reference). Note that we added a forth category 3 requirement, that the project must contain a significant level of ”nanotechnology”. The results of this sorting are attached in appendix 5. Note that the group discussed primarily only if the project idea was worthy of continuing to the second round. In all cases where the recommendation is to reject the idea the planning group was unanimous. Note, the key is in the number of asterisks (*) next to the project idea number in the first column. One ”*” indicates an idea which was doubtful, two ”**” indicates reject in this first round.

We agreed that the following persons will look in particular at the ideas in the respective clusters, and from these ideas formulate 1-2 (max 3) potential projects, which will be discussed at the next meeting, before we send rejection letters to those ideas we will reject.. Three clusters have no ”chairman” so far, SJS will try to find some competent persons to take care of those. A problem is how to pay for the time involved. Those persons without a particular cluster to work on are expected to look att all the ideas!

Cluster	**”chairman”**
B och C skydd	LÖ; TT
Biologiska och kemiska sensorer	LÖ, TT
Fönster material	Vet ej, SJS undersöker
Kommunikation	Vet ej, SJS undersöker
Verkan	MJ eller någon som han gör upp med
Autonoma spaningsnoder	Vet ej, SJS undersöker
EI	HN

SAT	SS
Sensorer	SJS
Ballistisk skydd	MJ

I will summarise the various clusters and their contents ASAP, but in the interest of speed am circulating these minutes in their present state. Those persons with paricular responsibility for a cluster can see from the table which ideas are included in ther cluster(s).

Steven J. Savage

Appendix 1.16.1 Contact details of Ag Nano members (as of 02-08-16)

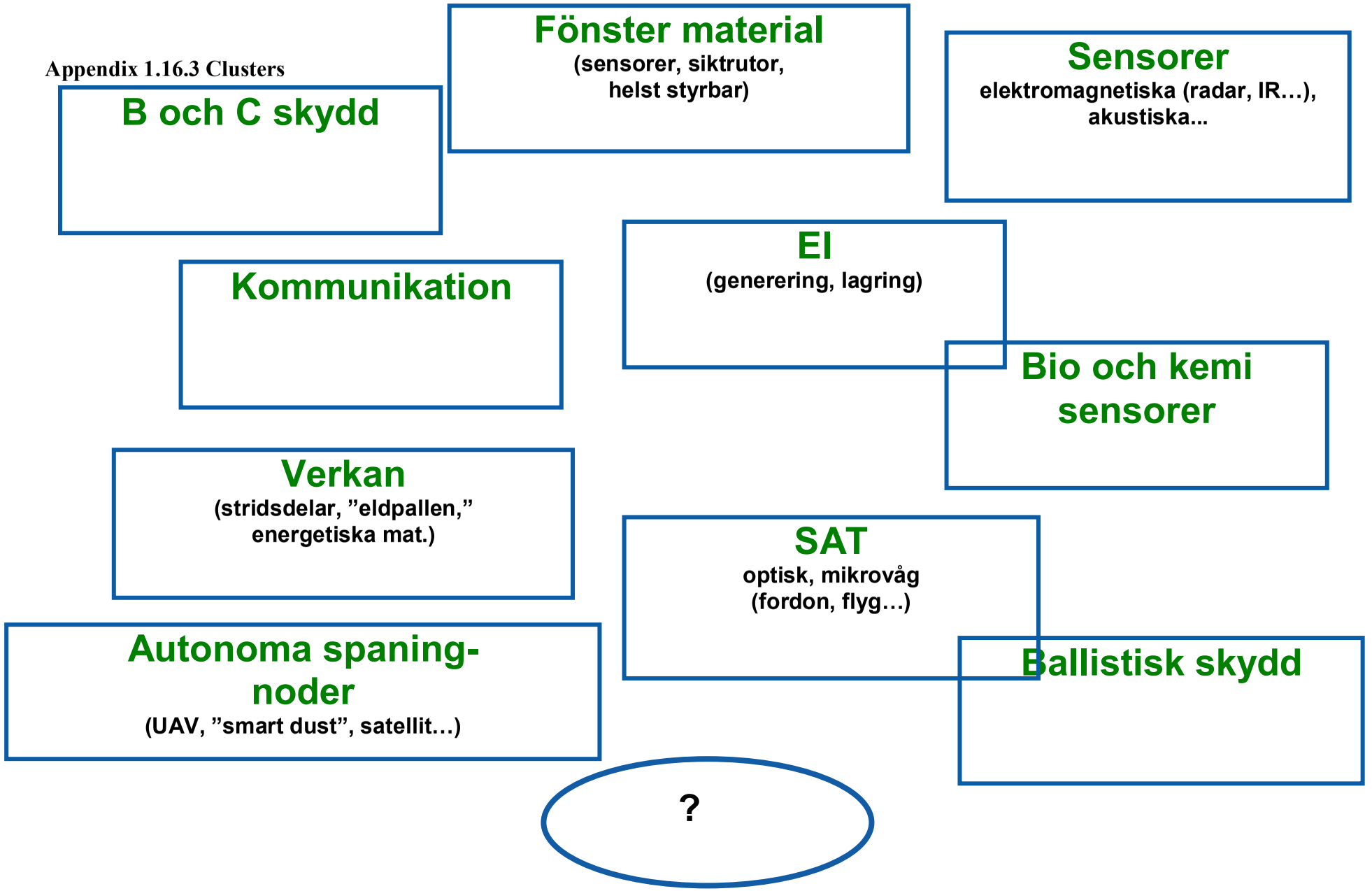
Name (avdelning)	Contact details	
Övlt Hans-Ove Görtz **STRA PLAN** **Ordförande i planeringsgruppen**	**Högkvarteret** **Försvarsmakten** **Lidingöv. 24** **107 85 Stockholm**	**Tel (dir) 08 788 7971** **Mobil 070 899 0825** **Fax 08 788 7778** **Tel (växeln) 08 788 75 00** **e-post hans-ove.gortz@hkv.mil.se** **hans-ove.gortz@telia.com**
Avdir Hans Norinder **KC Skydd**	**Försvarets materielverk** **Banerg. 62** **115 88 Stockholm**	**Tel (dir) 08 782 61 73** **Mobile 070 682 6173** **Fax 08 782 61 61** **Tel (växeln) 08 782 40 00** **e-post hsnor@fmv.se**
Lab Anders Callenås **Marknad**	**Totalförsvarets forskningsinstitut FOI** **Olaus Magnus väg** **Universitetsområde** **Box 1165** **581 11 Linköping**	**Tel (dir) 013 37 82 65** **Mobil 0709 27 7139** **Fax 013 37 8039** **Tel (växeln) 013 37 80 00** **e-post anders.callenas@foi.se**
Dr Steven J. Savage **Inst signaturmaterial** **Avd sensorteknik** **Sekreterare i planeringsgruppen**	**Totalförsvarets forskningsinstitut FOI** **Olaus Magnus väg** **Universitetsområde** **Box 1165** **581 11 Linköping**	**Tel (dir) 013 37 84 31** **Mobil 0709 27 73 27** **Fax 013 37 85 19** **Tel (växeln) 013 37 80 00** **e-post steven.savage@foi.se**
Foled Michael Jacob **IC inst för skydd och material** **Avd vapen och skydd**	**Totalförsvarets forskningsinstitut FOI** **Grindsjön** **147 25 Tumba**	**Tel (dir) 08 55 50 41 63** **Mobil 0709 27 70 94** **Fax 08 55 50 41 80** **Tel (växeln) 08 55 50 30 00** **e-post michael.jacob@foi.se**
Foled Sören Svensson **IC inst för signaturmaterial** **Avd sensorteknik**	**Totalförsvarets forskningsinstitut FOI** **Olaus Magnus väg** **Universitetsområde** **Box 1165** **581 11 Linköping**	**Tel (dir) 013 37 82 56** **Mobil** **Fax 013 37 85 19** **Tel (växeln) 013 37 80 00** **e-post sorsve@foi.se**
Fo Torbjörn Tjärnhage **Inst för miljö och**	**Totalförsvarets forskningsinstitut** **FOI**	**Tel (dir) 090 10 667 28** **Mobil** **Fax 090 10 6809**

skydd (ersätts av Lars Österlund)	**Cementvägen 20 901 82 Umeå**	**Tel (växel) 090 10 66 00**
Dr Lars Österlund (Fr o m 1 okt 2002) Inst för miljö och skydd	**Inst Tillämpad fisik Chalmers tekniska högskolan 412 96 Göteborg**	**Tel 031 772 4390 Fax 031 772 2967 e-post lars.osterlund@fy.chalmers.se**

Appendix 1.16.2 AgNano aktivitetsplan under tiden augusti-december 2002

Datum	Plats	Tid	Kommentar
16 aug	FMV filmsal C	0900-1500	AgNano möte #13 Syfte: vi går genom alla inkomna projektidéer, inkl kompletteringar (”enbladaren”) och bestämma oss för de idéer som ska går vidare och avslår de som ej passa in i programmet.
23 aug			Deadline. Ett brev skickas till de som fått avslag på sina ansökan (med motivering) *föreslås vi senarelägga detta till efter nästa mötet den 30/9*
30 aug	FMV C321	0900-1500	AgNano möte #14 Deadline. Ett brev skickas till de som är kvar med sin ansökan, men anvisningar om hur vi kommer att arbeta vidare, t ex vi nu vill har ”skarpa” projektansökningar
30 aug	Stockholm FMV eller Vinnova?	1015-1215	Träff med Vinnova för att beskriver nanoteknikprogrammet, discuss ev medfinansieriing. Ev även SSF med? *Oklart om träffen blir av.*
27 sept			Deadline. För förnyade projektansökningar
4 okt	FMV		AgNano möte #15. Utvärdering av projektförslagen.
22-23 okt	FOI-LIN	0900-1500	”workshop #2.Vi går genom och diskutera ingående projektansökningar tillsammans med sökanden. **Oklart om detta blir av**
31 okt-1 nov	London		Defence Nanotechnology konf. Möjligheter till kontaktskapande.
15 nov			Deadline. Första utkast till nanoteknikprogrammet klar
21 nov	FMV	0900-1500	AgNano möte #16. Diskuterar programutkast
29 nov			Deadline. Utkast nr 2
6 dec	FMV	0900-1500	AgNano möte #17. Slutlig diskussioner ang programmet.
12 dec			Deadline. Program klart, lämnas vidare

Appendix 1.16.3 Clusters



Appendix 1.16.4 Förslag till värderingsgrunder inför prioritering

Förslag till värderingsgrunder inför prioritering av projektidéer. Version 2. Vi bestämd bara prio 1 och 2 beaktas i en första vaderingsomgång

Idé/frågeställning
Här beskrivs kortfattat projektets idé och ev. frågeställningar för projektet.

Målbild
Projektets långsiktiga mål (ev. även delmål). Värdesätts efter hur tydlig målbilden beskrivs i projektberedning

1. Nytta för försvaret
Här beskrivs vilken långsiktig nytta försvaret (primärt ur FM, FMV och industrikompetens synpunkt, men även hela totalförsvaret) har av projektet under förutsättning att den kan uppnår förväntade resultat.

1. Genomförbarhet
Möjligheten att kunna genomföra projektet enligt plan (avseende kvalitet, kvantitet och tid)

2. Nätverk
Enligt projektberedaren möjligheter till att skapa nationella nätverk mot UoH, industri, FM, FMV, FOI, (FHS?) och internationella nätverk mot olika forskningsinstitut och högskolor.

2. Förmåga till nyttiggörande
Beskriver vilka(en) kompetenser som kan skapas – förnyas – behållas om projektet beviljas.

2. Förnyelse
Beskriver graden av ”förnyelse”

3. Anknytning till forskningstrender
Pågående forskning – nationellt och internationellt – som har relevant koppling till projektet (även försvarsforskning)

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Vilka(en) övriga finansiärer finns, och i vilka grad kan man dela på kostnaderna (ev uppdelat i olika etapper)

3. Tillämpningar
Vilka(en) konkreta tillämpningar kan projektet leda till? Hur relevant är de jämfört med försvarets behov av renovering/underhåll av befintliga system, eller uppbyggnad av kommande system, t ex YS Ny, HVM, helikopter, u-båtar, m m

3 Förslaget måste innehåller ”nanonära” teknik.

Värderingsgrunder kan även poängsättas om så behövs, t ex på en skala 1 till 5.

Ev bör man begär kompletterande uppgifter från förslagsställaren om projektidéen verka bra men det saknas en del uppgifter (detta för att gör en rättvis bedömning)

Löp nr	Material/ Process	Komponent	Delsystem	System	Prio. Grund 1		Prio. Grund 2			Område	Bedö mning
					Nytta?	Genom-förbarhet?	Nätverk ?	Förmåga till nyttiggör?	Förn yelse ?		
1	Högtemp RAM	Motorutlopp	Flygmotor	Flyg-plan	Ja	God	Finns	God	Ja	SAT	
2	MIP (B/C sensor)	Sensor-element	Portabelt sensor	Soldat	Ja	Troligtvis	Finns	God	Ja	B/C sensor	
3*	Organisk RAM/avs kärmning	Ytskickt	?	Fordon, flyg	Ja	Tvivelaktig	?	?	Ja	SAT	TVIVE LAKTI G
4**	? spraybar antenn	Antenn	?	?	Ja	Nej	?	?	Ja	Komm	AVSLÅ
5*	Energetis ka mater	Raketkrut	Robot	Vapen	Ja	Troligtvis	Möjlighe ten finns	Kanske	Ja	Verkan	TVIVE LAKTI G
6**	Diffusions spärr	Raketmotor Hylsor	Robot, ammunitio n		Tvivela ktig	Troligtvis	Möjlighe ten finns	?	?	Verkan	AVSLÅ
7**	?	Vapen-detaljer	Vapen		?	NEJ	NEJ	?	?	Verkan	AVSLÅ
8**	Kylning	Elektronik Fönster	Kretskort Sensor	Dator Robot	Ja	Tvivelaktig	NEJ	Låg	Ja	Komm/Ve rkan,sens orer	AVSLÅ
9*	Nanokomp termoplas	Elbox, skrov, fönster	Hölje, fönster etc	HVM	Ja	Troligtvis	Möjlighete n finns	God	Ja	Fönster, komm, spaning, ball skydd	TVIVE LAKTI G

10	B/C sensor	Sensor element	Portabelt sensor	Soldat, fast anlägg	Ja	Troligtvis	Möjligheten finns	Kanske	Ja	B/C sensor	
11**	Ledstråle System	Svepenhet		Bomb? Robot?	?	NEJ	Möjligheten finns	Kanske	Ja	Verkan	AVSLÅ
12	Keramer	Fönster Ball skydd	Sensor, Skydd	Soldat	Ja	God	Finns	Saknas tillverkare	Ja	Ball skydd, fönster, SAT	
13	B/C Sanering	Ytor	B/C skydd	fordon	Ja	Troligtvis	MF	Ja	?	B/C skydd	
14	B/C indikerin	Sensor		Soldat	Ja	Troligtvis	Finns	Ja	?	B/C sensor	Teknik utveckling?
15	SAT	Hög T RAM	Flygmotor	Flygplan	Ja	Troligtvis	Finns	Ja	Ja	SAT	Se 1
16	MEMS, B/C indik	Sensorelement	Portabelt sensor	Soldat	Ja	Troligtvis	Finns	Ja	Ja	B/C sensor	
17*	radarsensor	Antenn		Radar	Ja	Vet ej	Finns	Ja	Ja	Sensorer Spaning, komm	TVIVELAKTIG
18	Jonimplantation	Magnetisk sensor??	Sensor	Spaning	Ja	Troligtvis	MF	Ja	Ja	Sensor,komm Spaning	
19	QDOC	QDOT laser	Dator, komm	Komm, bildbehandling	Ja	På längre sikt?	MF	?	Ja	Sensor,komm	
20**	Modellering			SAT, komm	TV	Troligtvis	MF	Ja	Ja	SAT, komm, sensorer	AVSLÅ

21	Nanokomp	SAT (radar) Fönster		Flyg	Ja	troligtvis	MF	Troligtvis	Ja	SAT, komm,B/C skydd,fönster, sensorer, verkan	
22*	Nanokomp		Skrovateri al/fönster	YS-Ny HVM…	Ja	God	Finns	Ja	Ja	SAT, fönster, verkan, B/C skydd,	TVIVELAKTIG
23	Nanorör sensor	Sensorelemenet	B/C ind	Soldat	Ja	Troligtvis	MF	Ja	Ja	B/C ind	
24*	Signalbehandling	Metod	Magnetiska sensorer	Spaning	Ja	Vet ej	Finns	Ja	Ja	Sensorer, spaning	TVIVELAKTIG
25*	Trådlös komm		Sensorer	Spaning snod	Ja	Vet ej	MF	Troligtvis	Ja	komm, spaning	TVIVELAKTIG
26	MEMS	Filter		B/C ind, komm	Ja	Troligtvis	MF	Troligtvis	Ja	Komm, B/C sensor	
27	Termoelektrisk mtrl	Elgen, kylning			Ja	Kanske	Ja	Ja	Ja	Elgenerering, sensorer	
28	Mjukmagnetiska mtrl	Kärnor, rotor	Motor, trafo	UAV	Ja	Troligtvis	MF	Kanske	Ja	El, spaning, verkan	
29	MIP sensor	Sensor		Soldat	Ja	Troligtvis	MF	Ja	Ja	B/C indikering	

30	Lastbärande mtrl			Vapen, flyg, fordon	Ja	Kanske	MF	Ja	Ja	Ball skydd, verkan	Jfr Oskarsson
31	Ultrasnabb optiska mtrl	Filter	Laserskydd	Sikt, sensor	Ja	Troligtvis	Finns	Ja	Ja	Sensorer	
32	NIR nanokomp	Ytbeläggning		SAT	Ja	Kanske	MF	Ja	Ja	SAT	
33**	Nanokomp	Ytbeläggning		Sat	Ja	Kanske	MF	Ja	Ja	SAT	AVSLÅ
34*	Nanokomp fiber	Fiber	Skrov, B/C skydd		Ja	Kanske	MF	Ja	Ja	SAT, B/C skydd, verkan, ball skydd	TVIVELAKTIG
35**	Stybara ytor			SAT fordon	Ja	Kanske	MF	Ja	Ja	SAT	AVSLÅ
36*	MEMS	Inertial mät enhet		Stridsdelar	Ja	Vet ej	MF	Ja	Ja	Verkan	TVIVELAKTIG
37	Nanokomp barriär			Soldat	ja	Kanske	MF	Ja	Ja	B/C skydd, fönster…	
38*	Transparent nanokomp			Robot, fordon	Ja	Kanske	MF	Ja	Ja	Fönster, ball skydd	TVIVELAKTIG
39	Biocedala matrl			Filter,utspisning	Ja	Troligtvis	Finns	Ja	Ja	B/C skydd	Utvecklingsproj

40	µbränslecell			Spaning snod	Ja	Troligtvis	MF	Ja	Ja	El	
41	Foton bandstruk	Färg		SAT	Ja	Troligtvis	MF	Ja	Ja	SAT	
42	Nanoelektronik			Målsökare, komm	Ja	Troligtvis	Finns	Ja	Ja	Sensor, spaning, verkan, komm	
43	GMR	Sensor		Spaning	Ja	Troligtvis	Finns	Ja	Ja	Spaning	
44	?	NOEMS		Komm, spaning	Ja	Vet ej	Finns (utmärkt	Ja	Ja	Spaning, sensorer, komm	Följa upp!
45**	Plast/papper elektronik			Inventory	Ja	Vet ej	MF	Ja	Ja	Sensor	AVSLÅ
46	B/C indikering elektronik näsa			Soldat	Ja	Troligtvis	MF	Ja	Ja	B/C indik	
47*	Polymerer			IR SAT	Ja	Troligtvis	MF	Ja	Ja	IR SAT	TVIVELAKTIG
48**	?			Optik?	?	NEJ	Finns	Ja	NEJ		AVSLÅ
49**	?				Ja	Troligtvis inte	MF	?	Ja?		AVSLÅ
50*	?			El system	Ja	Kanske	MF	Ja	Ja	SAT	TVIVELAKTIG

51*	?			Fönster	Ja	Kanske	MF	Ja	Ja	Fönster	TVIVELAKTIG
52**	?			Fönster	Ja	NEJ	MF	Ja	NEJ		AVSLÅ
53**	Ytbelägg			Smörjning	Ja	?	MF	Ja	NEJ		AVSLÅ
54	NLO	Filter optisk		Optik	Ja	Kanske	MF	Ja	Ja	sensorer	
55	µanalys			Soldat	Ja	Ja	Nej	Ja	NEJ?	B/C sensorer	Utvecklproj
56	Accelerometer			Verkan	Ja	Troligtvis	FM	Ja	Ja	Verkan,sensorer	
57**	Spräng kisel			Elektronik	Ja	Troligtvis	MF	Ja	NEJ		AVSLÅ
58	Nanokomp			Skrov, HVM, fordon	Ja	God	MF	Ja	Ja	Spaning, verkan, ball skydd, fönster, B/C skydd, SAT	
59*	?			SAT	Ja	?	Finns	Ja	Ja	SAT	TVIVELAKTIG
60	IR sensor			Spaning	Ja	Troligtvis	MF	Ja	Ja	Sensorer	
61*		Piezoaktuator	Ytor	Flyg	Ja	God	MF	Ja	?	Spaning, verkan, SAT	TVIVELAKTIG
62	Fotonbandgap			Radar	Ja	Vet ej	MF	Ja	Ja	Sensorer, SAT	
63	Nanoelektronik			Sensorer	Ja	Vet ej	MF	Ja	Ja	Komm, sensorer	

64	Keram nanokomp			Skydd	Ja	God	Finns	Ja	Ja	Ball skydd	
65	Polymer nanokomp			SAT	Ja	God	Finns	Ja	Ja	SAT, fönster, spaning, ball skydd	
66	POSS				Ja	Troligtvis	Finns	Ja	Ja	Verkan, ball skydd	
67	Ytskikt dekaler			flyg, fordon	Ja	Kanske	Finns	Ja	Ja	SAT	
68				Fönster	Ja	Troigtvis	Finns	Ja	Ja	Fönster, SAT	
69*	Elledande	Polymer nanokomp			Ja	Troligtvis	Finns	Ja	Ja	Sensorer, verkan	TVIVELAKTIG
70*		Polymer nanokomp			Ja	Troligtvis	Ja	Ja	Ja	SAT	TVIVELAKTIG
71	THz MEMS				Ja	Troligtvis	MF	Ja	Ja	Sensorer, spaning, komm	
72	C60, nanorör				Ja	Troligtvis	MF	Ja	Ja	B/C Sensorer	
73	Polymer nanokomp	Skrovmatrl, fönster		Flyg, fordon, fartyg	Ja	God	Finns	Ja	Ja	SAT, verkan, sensorer, B/C skyddm ball skydd	
74**	Info utbyte				Ja	God	Finns	Ja	NEJ		AVSLÅ

75	µbränslecell				Ja	Troligtvis	MF	Ja	Ja	El	
76	biospektroskopi									b/C sensor	
77	Akustisk SAT									SAT	
78**	mikronålsteknologi										AVSLÅ
79	MEMS									El	
80	KE/RSV									verkan	
81	NEMS									sensorer	
82	Oxider, termokromisk material, nanorör									sensorer	

APPENDIX 1.17 Meeting notes 2002-08-30 AgNano meeting #14

FM Nanoteknik initiativ

Mötesanteckningar, AgNano möte #14

Datum: 2002-08-30

Plats: FMV Tre Vapen, rum C321

Närvarande: Anders Callenås (AC)
Michael Jacob (MJ)
Hans Norinder (HN)
Steven Savage (SJS)
Sören Svensson (SS)
Lars Österlund (LÖ)
K.-G. Lövstrand (KGL), part of the morning
Hans-Ove Görtz (HOG) with us during lunch

Tid: 0900-1530

Notes from previous meeting
No comments.

Agenda
Additional point raised by KGL regarding Rolf Dahlberg's interest to attend a conference or similar on nanotechnology in defence applications. The upcoming conference in London (31 Oct-1 Nov) may be of interest.

Note, I have spoken to RD about this, he is interested in attending, and has the conference information. We will keep him informed about our travel plans. Also, both HN and LÖ plan to attend.

Contacts with Vinnova, etc
KGL explained the contacts FMV have with Vinnova. There is a desire to coordinate projects and funding, to avoid duplication of effort, and to use any advantages which may arise from cooperation. However, it is important that any financial support from FM and any similar support from Vinnova (or other publicly funded organisation) be kept separate. This means careful planning of projects where joint funding may be possible in the future, e.g. Phase 2.
Barbro Malm (from FMV) has had high level contacts with Vinnova, but nanotechnology was not discussed. A further meeting between FMV and Vinnova is planned for 9 Sept.
KGL spoke with Karl Einar Sjödin (Vinnova, 08 473 3113) during our meeting. Vinnova is presently putting the finishing touches to a document outlining their policy for nanotechnology, which is expected to be ready within about a week (6 Sept.). KGL will contact Sjödin again in a few days. After that it is suggested we arrange a meeting where AgNano presents its plans and we initiate discussions as to if and how we should continue. Clearly there is an interest from both sides to coordinate our

efforts, but this should be done so that the financial commitments are clearly separated. KGL will keep SJS informed of progress. There are other potential sources of joint funding, including the EU (6th Framework program), SSF, etc. Also, WEAG has initiated some form of interest in nanotechnology, although details are sketchy. None of these are likely to be useful sources of complementary funding in the near future, so any project supported by the planned FM nanotechnology program must be financially sound from the beginning. However, we should keep in mind that this could be the basis for some form of cooperation in the future (e.g. EU projects demand 50% financing from other sources, WEAG cooperation requires each nation to support its own projects).

Economy

1) In our own project (i.e. until 2002-12-31)
SJS is concerned that the budget is insufficient for the volume of work. However, it seems that MJ and SS do not have more time available than that already allocated, therefore do not need additional financing. Note, this question was raised later in the meeting, where it became clear that we do not have financing for additional work such as peer review of final project applications.
2) LÖ pointed out that in the next round of instructions to applicants we must indicate an approximate (or at least maximum) figure. Note, this was taken up again later in the meeting.

Contact with companies which may be relevant to the FM nanotechnology program

ABB has an internal nanotechnology program, annual turnover about 20 Mkr, i.e the same as the planned FM nanotechnology program. We should at least make contact with ABB to discuss any possible joint interests. LÖ agreed to do this (he has contact with Thomas Liljenberg).
Other companies which may be interested/relevant should be contacted. HN has e-mailed Åkers Protection, no answer received yet.
Note, even if a company/researcher/organisation has not contacted us, it is in our interests to try to make contact. We are designing the FM nanotechnology program, and are responsible for its content, which should be as relevant/good as possible.

Presentation of the results of AGNano members work since the previous meeting

At the previous meeting it was decided that SS, MJ, LÖ, HN and SJS were to look though the project “clusters” we agreed on, and to try to “compose” from each cluster 1-4 project ideas/cluster which match the requirements set up for the FM nanotechnology program.

Each of us presented the results of our efforts. These are summarised in Appendix 1. As we had not previously discussed how this was to be presented, we had each chosen different methods to approach the task. However, we later reached a consensus on how to proceed with the next stage.

HN – cluster “El” Has enlisted the fuel cell group from FMV (Isabel Andersson) to help with this. Results expected shortly.

SS – cluster “SAT” Presented 4 project ideas, with proposed budgets and “projektberedare.”
MJ – clusters “Ballistisk skydd” and “Verkan” Presented each project and commented on them individually, followed by a brief summary of potential project ideas.
LÖ – clusters “B/C sensorer” and “B/C skydd” presented briefly 4 project ideas, complemented by proposed budgets and “projektberedare.”
SJS – clusters “sensorer, fönster, kommunikation and autonoma spaningsnoder” Would have liked to share this task with additional experts, but judged the time and budgetary constraints too limited to allow this. However, has contacted several of the project applicants for explanations and additional information where necessary. Presented 4 (maybe 5) project ideas and proposed “projektberedare.” Budget suggestions not presented but will be included in the attached appendix.

Peer review
We agreed that peer review of the final project applications is essential. Each of us is to suggest suitable reviewers for “our” clusters. Compensation to the reviewers of 1500 kr/project was suggested, this is a figure used by Vinnova. If we have about 20 project applications in the final round, and two reviewers per application this results in a cost of 60 kkr. At present there is no budget for this, or any other part of the reviewing process.

To do!

Who	Task	Deadline
SS, MJ, LÖ, HN and SJS	Suggest reviewers, circulate to AgNano	6 Sept
HN	Circulate FMV contract example	6 Sept
LÖ	Circulate Mistra contract example	6 Sept
SS	Circulate fotonik program contract	6 Sept
SJS	Summarise “kostnadspunkter”	6 Sept
All	Check the activity plan for possible timetable clashes	ASAP
SJS	Draft letter to all who have submitted ideas	6 Sept.
LÖ	Contact ABB	ASAP
HN	Contact Åkers Protection	ASAP
SS, MJ, LÖ, HN and SJS	Confirm the project ideas presented at this meeting. Look again at the project ideas and check that no ideas have been “forgotten,” e.g. if no short version was submitted, fill in any blanks, give more thought to the economic framework, etc	6 Sept.

Activity plan
Our activity plan through the remainder of this year was discussed and revised. See Appendix 1.17.2

Instructions to "projektberedaren"
We must give the "projektberedare" instructions on how the next (and final) project applications should be formulated. A common format, containing the same information will make evaluation of the applications easier, and simplify the procedure. This was discussed at some length, but I don't recollect we actually decided on any details other than that a maximum economic framework must be given, and that the applications will be reviewed by an independent reviewer (probably two reviewers per project application). The application forms to be circulated by HN, SS and LÖ will give some guidance, and maybe we can simply "copy and paste" appropriate sections from these documents. This will also give the FM nanotechnology program improved credibility when we discuss possible "joint projects" with Vinnova.

Information to those who have submitted ideas
It was suggested that everyone who has submitted ideas to the program should receive the same information, within the very near future. This should be a letter informing everyone how our plans are progressing, and that those ideas we consider most relevant will be followed-up in the near future.
I will draft a letter to this effect and circulate to AgNano later this week. I hope we can mail this by Friday, or early next week. Note, a first draft is attached, for comment. See appendix 3.

Selection process
To assist in the selection process we will have the reports from our reviewers. These will evaluate the project applications from the point of view of the scientific content, and from the point of view of usefulness in defence applications. It will be useful if we can identify persons within FMV or HQ (or maybe other persons in the "total defence family" who can help with this.
We must also use the previously established "värderingsgrunder" in the project evaluation.

"vid tangentbord"

Steven Savage

Appendix 1.17.1 Summary of the project ideas presented 020830

Projekttitel	Projektberedare	Budget (fas 1) (Mkr/år)	Kluster/ Proposed by
Energetiska material med styrda prestanda	Henrik Östmark (FOI) samt ev. Lars Olsson (Saab Bofors Dynamics)	2	Verkan/ MJ
Effektiva verkansdelar för KE och RSV	Magnus Oskarsson (FOI)	3	Verkan/ MJ
Effektiva ballistiska skydd, gärna med flerfunktionellitet	Magnus Olsson (FOI) samt ev Pontus Nordin (Saab AB)	4	Ballistiskt skydd/ MJ
”El förslag” kommer snart	TBD	TBD	El/ HN
”THz kommunikation”	Staffan Rudner (FOI) samt en industri (Ericsson?)	TBD	Kommunikation/ spaningsnoder/ sensorer SJS
Skydd mot laser		TBD	Sensorer/ SJS
”komplett övervakningssystem”		TBD	Autonoma spaningsnoder/ SJS
Genomskinliga fönster med integrerade SAT		TBD	Fönster/ SJS
”övriga sensorer”			
Polymerkomposit nanoSAT	S. Savage/M. Lindgren (FOI)	3	SAT/ SS
Högtemp nanoSAT	C. Lopes/A. Jänis (FOI)	2	SAT/ SS
Styrbar nanoSAT	S. Björkert/J.-O. Ousbäck (FOI)	1,5	SAT/ SS
NanoSAT-färg	P. Edman (Saab Barracuda)/P. Alberius (Ytkemiska institutet)	1,5	SAT/ SS
B/C destruktion	L. Österlund (FOI)	2.5	B/C skydd/ LÖ
Barriärmaterial	M. Hedenqvist (KTH)	1	B/C skydd/ LÖ
Sensorytor	K. Larsson (Imego)/L. Ye (LU)	4.5	C
Detektionsmetoder ”lab-on-a-chip”	M. Lindgren (FOI)/F. Nikolieff (UU)	4.5	SAT/ SS

Appendix 1.17.2 Activity plan (revised 020830)

Datum	Plats	Tid	Kommentar
16 aug	FMV filmsal C	0900-1500	AgNano möte #13 Syfte: vi går genom alla inkomna projektidéer, inkl kompletteringar (”enbladaren”) och bestämma oss för de idéer som ska går vidare och avslår de som ej passa in i programmet.
23 aug			Deadline. Ett brev skickas till de som fått avslag på sina ansökan (med motivering) *föreslås vi senarelägga detta till efter nästa mötet den 30/9*
30 aug	FMV C321	0900-1500	AgNano möte #14 Deadline. Ett brev skickas till de som är kvar med sin ansökan, men anvisningar om hur vi kommer att arbeta vidare, t ex vi nu vill har ”skarpa” projektansökningar
30 aug	Stockholm FMV eller Vinnova?	1015-1215	Träff med Vinnova för att beskriver nanoteknikprogrammet, discuss ev medfinansieriing. Ev även SSF med? *Oklart om träffen blir av.*
18 okt			Deadline. För förnyade projektansökningar
4 okt	FMV F2	0900-1500	AgNano möte #15 diskutera peer review grupper, presentera för HOG
31 okt-1 nov	London		Defence Nanotechnology konf. Möjligheter till kontaktskapande.
14 nov (reserv 15:e)	FMV	0900-1500	AgNano möte #16. Diskuterar programutkast
29 nov			Deadline. Utkast nr 1. Sedan under veckan sker e-post revidering
6 dec	FMV	0900-1500	AgNano möte #17. Slutlig diskussioner ang programmet. Sista justeringar görs.
12 dec			Deadline. Program klart, lämnas vidare

Appendix 1.17.3 Förslag till brev

FOI brevhuvud

Datum

Du har tidigare lämnat idé (er) till projekt inom Försvarsmaktens planerade program Nanoteknik i Försvarstillämpningar, och detta tackar vi dig för.

Med detta brev ville planeringsgruppen nu informera Er om programmets planeringsläge, samt hur vi kommer att fortsätta med hanteringen av de inkomna idéerna.

Alla idéer har granskats, och en grov prioritering har gjorts, varefter idéerna har indelats i ett antal kluster som ha direkt anknytning till försvarets framtida teknikbehov, t ex signaturanpassningsteknik, verkan, B/C sensorer, m m. Cirka tio stycken kluster finns. Ett flertal idéer tas upp i fler an ett kluster. Alla idéer i samma kluster vägs samman och ett antal ”kärnor” till tänkbara projekt har tagits fram. Totalt rör det sig om ett tjugotal projekt. Av dessa tycker vi tiotalet kan komma att finansieras. För dessa kärnor utses nu två projektberedare/projekt, som uppdras att bereda ”skarpa” projektansökningar, innehållande detaljerade mål, aktörer, tids- och ekonomiska ramar. Dessa ansökningar ska vara färdiga till mitten av oktober, varefter de ska granskas av minst två oberoende sakkunniga.

Du kan därför komma att kontaktas av en, eller om ditt förslag behandlas i mer an ett kluster flera av projektberedarna, för fortsatt utredning och eventuellt komplettering av idén du har inlämnat. Allt eftersom förslagsberedningsprocessen fortlöpa granskas på nytt alla idéer för att säkerställa kvaliteten på förslaget, varför vi kan inte lämna besked nu om just din idé(er) kommer att finansieras eller inte.

Vi ber Dig därför visa fortsatt tålamod, samt om ni bli kontaktade av en eller fler projektberedare svara så fort som möjligt.

Vänliga hälsningar,

Steven J. Savage

Contact details of Ag Nano members (as of 02-08-30)

Name (avdelning)	Contact details	
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Övlt Rolf Dahlberg **PLAN B**	**Försvarets materielverk** **Banerg. 62** **115 88 Stockholm**	**Tel (dir) 08 782 6245** **Mobil** **Tel (växel) 08 667 5799** **Fax 08 782 5642** **e-post rodah@fmv.se**
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Dr Lars Österlund **(Fr o m 1 okt 2002)** **Inst för miljö och skydd**	**Inst Tillämpad fysik** **Chalmers tekniska högskolan** **412 96 Göteborg**	**Tel 031 772 4390** **Fax 031 772 2967** **e-post** **lars.osterlund@fy.chalmers.se**

APPENDIX 1.18 Meeting notes 2002-10-15 AgNano meeting #15

MÖTESNOTERINGAR 2002-10-15/SeS

Möte: AgNano #15 4 oktober 2002

Plats: FMV, Stockholm

Deltagare: AC Anders Callenås HN. Hans Norinder
LÖ Lars Österlund SJS Steven Savage
SS Sören Svensson MJ Mikael Jacob
SeS Siv Ek-Setterberg HOG Hans-Ove Görtz (delvis)
Förhindrad: Rolf Dahlberg

Mötesordförande: SS
Protokolljusterare: SJS
Mötessekreterare: SeS

1. Föregående mötets protokoll
Minnesanteckningarna från möte #14 föranledde inga övriga kommentarer. Dock noterades att två namn var fel och behöver ändras. Namnändringar: Barbro MALMER, Olsson heter OSKARSSON

2. Lista över förväntade beslut vid dagens möte
Ett tillägg gjordes till dagens beslutslista: Vart skall ansökningarna skickas och vilken myndighet ansvarar för hanteringen? Beslutades att FOI sköter den praktiska hanteringen då programmet ej är beslutat än. Ansv. SJS
Lista över beslutade punkter på möte #15
Projektberedningsprocessen
Projektrubrik (bilaga 4)
PB:arna
Anvisningar till PB
Vem/hur och när ta kontakt
Praktiska detaljer
Deadline för ansökningar på FOI skrivbord
Granskningsprocessen
Granskare
Vem/hur när ta kontakt
Anvisningar till granskare
Praktiska detaljer
Deadline för rapporter på FOI skrivbord

Programskrivningsprocessen
Programskrivningsgruppen
Nytt datum för deadline 28 februari 2003
Tidtabell
Reviderad tidtabell (bilaga 6)
Defence Nanotechnology Conference
Vem? Hur? När? (namn, se punkt 7)
Praktiska detaljer

3. Anvisningar till projektberedare
Vid genomgång av förslaget till ansökningsformulär beslutades ett antal förändringar. Blanketterna Ansökan (bilaga 1) och Anvisningar (bilaga 2) uppdateras i enlighet med dessa. Ansv. SJS/SeS

Prel. blankettpaket ut till AgNano arbetsgrupp senast fredag e.m. nästa vecka. (OBS, detta har försenats en vecka).
Påminnelse ges 1 vecka innan deadline (4 nov). Ansv resp gruppledaren. Lista på samtliga beredare sänds till SJS.

Följebrev skrivs till projektberedare och skickas tillsammans med dokument med Förslag till värderingsgrunder (bilaga 3) inför prioritering av projektidéer, det som värdesätts. Texterna formuleras om till frågor och punkter.

4. Tidtabell för projektberedning
Beslöts hur hantera den uppkomna förseningen av planeringen. Färdigdatum för program-förslaget förlängs till 28 februari 2003 i enlighet med förslag från HOG. AC påpekade att det eventuellt kan krävas en omförhandling/justering av beställningen med FMV, dock inte med FM.

5. Summary of project ideas
Genomgång av listan (bilaga 4) som uppdateras av SJS. Kolumn med Granskare läggs till och 1 nov skickas ut en förfrågan om det fortfarande finns ”luckor” i listan. Ansv SeS. Den uppdaterade listan över projekt och projektberedare går på remiss till gruppen nästa vecka. Diskussion fördes angående vilka projektberedare som skall vidtalas. Beslutades: två beredare på varje projekt. Bägge kontaktas och både skriver på. Ingen i AgNano-gruppen sitter med som beredare p g a risken för att sådan medverkan skulle kunna uppfattas som ett jäv-förhållande.

6. Granskare
Diskussion angående peer reviewers (granskare): Ansökningarna måste gå på review antingen till en internationell reviewer eller till flera väl insatta reviewers. Skall detta delas upp i två steg för att få en rättvis och kompetent bedömning, vetenskaplig bedömning (universitet /högskola) på klusternivå? Det är kanske önskvärt också med en extern granskare med hel-hetssyn. MJ kontaktar Richard Jones för en eventuell granskning av hela programmet. En eventuell motsvarande granskning av t ex Gernot Pomrenke diskuteras men inget beslut fattades. Diskussionen var lite rörig, men uppfaddates på följande sätt. Richard Jones får alla ansökningar för att kunna granska programmet som helhet. Vi kan välja att lämna våra priori-teringar till Richard eller ej. Dessutom, granskas varje ansökan för sig, men gruppvis (d v s en vetenskaplig granskare per grupp), samt samma ur försvaretsperspektiv (t ex av några från försvarsfamiljen), även detta gruppvis.

Steg i tänkt internationell samverkan, hinner vi med detta? MJ tar upp frågan på CEPA-mötet nästa vecka. Tänkbart vore representanter från Frankrike, Tyskland, Storbritannien. Om Richard Jones ställer upp (av 3 tänkbara kandidater) så erbjuds han uppdraget direkt. Om inte, så måste nytt beslut tas i skiftet okt/nov.
Behövs ej en person/officer från FMV och/eller FM som ser på det hela enligt HOG.
Deadline för granskningen: 18 nov sänds material ut, in igen13 dec (3 v)

7. Defence Nanotechnology Conference i London
SJS, AC, LÖ, RD och SS åker.

8 Andrad datum för AgNano-möte #17
Mötet som planerats till 6 december 2002 utgår, nytt datum blir 14 januari 2003 (preliminärt).

APPENDIX 1.19 Meeting notes 2002-11-14 AgNano meeting #16

Noteringar AgNano-möte #16

14 november 2002, FMV

Mötesordförande: Sören Svensson SS
Justerare: Steven Savage SJS
Mötessekreterare: Siv Ek-Setterberg
Deltagare: Anders Callenås AC, Michael Jacob MJ, Hans Norinder HN, Lars Österlund LÖ, Rolf Dahlberg RD, Hans-Ove Görtz HOG (delvis)

1. Föregående mötesanteckningar
Behandlades inte p g a tidsbrist, tas upp vid nästa möte.

2. Översikt Defence Nanotechnology 2002 konf.
Behandlades inte p g a tidsbrist. SJS skriver reserapport som sänds ut som information, dessutom bifogas SJS noteringar från kontakter som togs på konferensen (bilaga 1).

3. Översikt besök till Japan Defence Agency
Behandlades inte p g a tidsbrist, tas upp vid nästa möte.

4. Uppföljning av kontakter med DSTL
Beslutades att SJS i mån av tid åker på studiebesök eller artighetsvisiter till dessa personer. Viktigt att hålla kontakter med ”main players”, ev kan HOG också åka. Besök hos DSTL v 4-5, SJS tar fram förslag.

5. Granskningsprocessen
Beslutades att granskarnas rapporter skall vara öppna och skriftliga. De skriftliga vetenskapliga granskarnas rapporter kompletteras senare med en muntlig ”hearing/review” (mellan 10 och 19 februari) av programförslaget av programgranskare (grupp) innan programförslaget skickas till FM. SJS förvarnar samtliga projektberedare. Projektförslaget skall dock helst inte spridas hur som helst. Frivillig “non-disclosure agreement”? SJS visade förslag till text som godkändes av FOIs jurist 19 november, texten bifogas (bilaga 2). OBS ta bort ”Bilaga 2” innan dokumentet används.

RD visade Kepner-Tregoe jämförelsemodell som förslag till instrument för rangordnings-arbetet.

6. Nanoteknik program ”management”
Behandlades inte p g a tidsbrist. Förslag visades för HOG efter dagens möte. Bifogas som bilaga 3.

7. Val av projektledare
Behandlades inte p g a tidsbrist, tas upp vid nästa möte.

8. Översikt aktiviteter 2002
Behandlades inte p g a tidsbrist, tas upp vid nästa möte.

9. Planerade aktiviteter 2003

Aktivitet 1

Beslutades att 9-10 januari förs diskussioner samt väljs prioriteringsinstrument. Preliminär prioritering av förslagen. HN anordnar internat i Stockholm.

Aktivitet 2

Diskuterades ev dragning på HKV. ***Beslutades*** att HOG bereder och lägger upp presentationsstrategi m m (troligen 2-stegs).

Aktivitet 3
Möte 23 januari (preliminärt, AgNano-möte #17) FMV. (Förlaga av programförslaget cirkuleras för kommentarer innan.)

Aktivitet 4
Beslutades: Hearing äger rum i två dagar mellan 10-19 februari och förläggs till FOI i Linköping (ca 25-30 pers.). SJS bokar lokal. Info går ut till alla berörda projektberedare (SJS/SES). SJS kontaktar granskarna och bestämmer datum. AC kontrollerar vilken MoU åberopas för informationsutbyte.

Aktivitet 5
Ev besök hos DSTL v 4-5. ***Beslutades*** att SJS förbereder besöket.

Aktivitet 6
20 februari – preliminärt AgNano-möte #18 för att diskutera programförslaget, ekonomiska planen och slutgiltiga prioriteter (FMV).

Aktivitet 7
28 februari - Leverans av programförslaget till FM. OBS - Sportlovs vecka.

Beslutades: Att G Pomrenke, W Mullins, R Jones vidtalas för programgranskning. SS och SJS skriver utkast till brev som sedan undertecknas av HOG.

Enligt HOG kan ett programbesked komma redan i april 2003. Offertrundan tar vid efter det och den faktiska verksamheten (programplanering) kan möjligen komma igång efter sommaren.

HOG ställer frågan: FMV eller FOI som beställare? Frågan bordlägges tills vidare.

10. Jäv situationer/inköpsproblematik
Förutses problem med ansökningar från t ex FOI? SJS kontaktat juridiska enheten på FOI: Det borde inte uppstå problem med samordningen mellan FOI och industri. RD tror ej heller på problem med upphandling. De som sitter nära (material, skydd, osv) har inte rätt att tycka i sådana frågor.

Beslut: Det anses kunna uppstå jävsituation för person när projekt bedöms (gränsen går vid FOI avdelningstillhörighet). När projekt diskuteras skall den i AgNano planeringsgruppen berörda personen lämna rummet.

11. Övriga frågor
Rapporter från klusteransvariga. – Hur går det med projektberedningen? Behandlades inte p g a tidsbrist.

www.nano.foi.se
Behandlades inte p g a tidsbrist.

12. Sekretess
Beslut enligt nedan delges de som signalerat sekretessproblem under ansökningsskrivandet.

Projektansökningarna ska vara öppna. De som på måndag lämnar in hemliga ansökningar kommer att få en vecka (25/11 ny deadline) för att omarbeta materialet till en öppen ansökan och en sluten extra bilaga.

Grundtanken vid beredningsdiskussionerna var att hemligstämpling inom programmet endast ska göras med hänsyn till rikets säkerhet. Imaterielrättsliga frågor inför programstarten bör lösas med gängse instrument: patentsökningar m.m. Resultat som framkommer under projektets gång blir i första hand försvarets egendom.

Programmet kan efter behov delas i en grupp av öppna projekt och en grupp av slutna projekt både under Fas I (två år) och Fas II (tre år).

Vid protokollet	Justeras
Siv Ek-Setterberg	Steven Savage

APPENDIX 1.20 Meeting notes 2003-01-09/10 AgNano meeting #17

Noteringar AgNano-möte #17
Tid: 9-10 januari 2003, Plats: Södergarns kursgård, Lidingö.

Mötesordförande: Rolf Dahlberg RD (sista punkten Anders Callenås)

Mötessekreterare: Hans Norinder HN

Deltagare: Anders Callenås AC Michael Jacob MJ Steven Savage SJS
Lars Österlund LÖ Hans-Ove Görtz HOG (delvis 10/1)

1. Inledning

Declaration of interest

Beslöts att varje kluster föredrages av resp klusterledare.

Vid bedömning av resp. ansökan kommer den som är jävig att avstå från att delta i beslut, FOI personal där egna avdelningen var engagerad i ansökan.

2. Diskussion samt beslut om vilken metod/modell/process som ska användas för utvärdering av projektförslagen.

Efter diskussion enades mötet om.

Mötets målsättning: Att från våra 18 projektansökningar komma ner till 10 st. Vi bör eliminera minst 8 st. projektförslag.

Motiv: Föra att få rimlig storlek på antalet programmet, bör antalet projektansökningar vara i balans med syftet med hearingen och tillgänglig ekonomi.

Underlag ska utarbetas för hearing 6-7 mars.

Målsättning: **Bra om vi kommer till consensus.**

Vilka kriterier är de viktigaste, vilka är kraven och vilka ger mest nytta för FM. Hur bra kan vi avgöra genomförbarheten?

En oavlåtlig uppgift för oss är att vi rangordnar kraven. Efter våra bedömningar är troligen endast de förslag kvar som uppfyller de väsentliga kraven.

Finns det andra möjligheter att lösa problemet, finns det oftast civila intressenter.

Diskussionsöverväganden som bör göras - kommer det fram snarlik teknik på civila sidan?

Vi beslöt oss för att börja med Kepner-Tregoe metoden och gå igenom kriterierna.

3. Överväganden

Vi kom fram till följande innebörd hos kriterierna:

Nytta och förnyelse för FM*: **angeläget problem för framtida FM; signifikant prestandahöjning; genuint försvarsintresse/tydlig FM ”sponsor” ingen annan teknik tillgänglig; - nya möjligheter/förmågor för FM**

Genomförbarhet: **FoU kvalitet/förmåga; svårighet/risk i projekt; realistisk planering; realistiska mål; konkretisering av förslag**

Bas i civil FoU: **Nyckelkompetens inom UoH; idé/engagemang i UoH -”state of the art”; nanoanknytning; internationell FoU; tillämpad forskning möjlig**

Andra drivkrafter: **”dual use” civil kontra försvaret (”win-win”); annan finansiering; betydelse av NanoF finansiering; (”value for money”); försvarsspecifika tillämpningar**

Nätverk: -FM* **(”avnämare inom FM*”), -svensk UoH, internationell UoH, svensk industri, internationell försvarsforskning; befintligt eller förutsättningar för skapande**

*) FM**= totalförsvaret (inkl. FMV, FOI)**

Parvis jämförelse gav följande summa:

Nytta och förnyelse för FM	**9**
Genomförbarhet	**6**
Bas i civil FoU; Andra drivkrafter	**5**
Andra drivkrafter	**2**
Nätverk: -FM* (”avnämare inom FM*”)	**3**
	25

Vid bedömning av projekt var inte de närvarande som ansågs jäviga:

Michael Jacob: deltog inte vid bedömning av projektansökningar nr 1-4

Steven Savage: deltog inte vid bedömning av projektansökningar nr 6-14

Sören Svensson: deltog inte vid bedömning av projektansökningar nr 6-7, 9-14

Lars Östlund: deltog inte vid bedömning av projektansökningar nr 15-18

Sammanställning över utvärdering av resp. projektförslag

Projekt nr	Nytta och förnyelse för FM	Genom-förbarhet	Bas i civil FoU	Andra drivkrafter	Nätverk	Summa	Kon-sekvens
1	5	2	2	3	4	94	AVSLÅS
2	4	4	8	9	9	161	X Kvar
3	5	4	8	6	9	164	X Kvar
4	7	2	2	5	7	129	AVSLÅS
5	7	1	7	2	5	137	AVSLÅS
6	7	3	8	3	8	168	?
7	8	7	7	9	7	209	X Kvar
8	2	4	8	5	5	119	AVSLÅS
9	4	2	4	9	8	122	AVSLÅS
10	2	2	3	8	5	84	AVSLÅS
11	2	5	6	8	6	124	AVSLÅS
12	5	3	5	9	9	148	?
13	8	2	4	6	8	156	?
14	6	6	8	6	8	184	X Kvar
15	1	7	10	5	8	150	?
16	8	2	5	3	8	154	AVSLÅS
17	8	2	7	5	8	170	X Kvar
18	8	7	10	6	8	222	X Kvar

Efter bedömningen av alla projekt.
Hans-Owe anlände och fick en sammanfattning av vad vi gjort.

Rolf Dahlberg lämnar mötet.
Anders Callenås tog över ordf. rollen.
Fortsatt diskussion om främst projektförslag som fått markeringen frågetecken.
Mötet avslutades.

Vid tangentbordet:
Hans Norinder

APPENDIX 1.21 Meeting notes 2003-01-23 AgNano meeting #18

Noteringar AgNano-möte #18
Tid: 9.00-13.40 23 januari 2003, Plats: Rum I419, TrV , FMV.

Mötesordförande: Rolf Dahlberg RD

Mötessekreterare: Hans Norinder HN

Deltagare: Anders Callenås AC Michael Jacob MJ Steven Savage SJS
Lars Österlund LÖ Hans-Ove Görtz HOG (delvis)

1. Förslag till agenda. Föregående mötes protokoll

Rolf Dahlberg utsågs till ordförande och Hans Norinder till sekreterare.

Vi enades om följande dagordning

1. **Föregående mötets anteckningar**
2. **Färdigställande av de projektförslag som ska presenteras på Hearing 6-7 mars.**
3. **Utformning av program vid hearing**
4. **Programförslag för försvarsmaktens nanoteknikprogram**
5. **Managementfrågor**
6. **Inledande program**
7. **Kommande möten**

<u>Föregående mötes anteckningar</u>

Föregående mötesprotokoll gick igenom. Mötet enades om att anteckningar endaste ska omfatta beslut och viktiga erfarenheter. Projektvisa överväganden samlas i ett komplement som endast fördelas till gruppen som arbetsunderlag.

2. Färdigställande av de projektidéer som ska presenteras på hearing

Vi diskuterade värderingsgrunderna, kvar efter diskussionen var 8 st. projekt som ska presenteras vid hearingen. Efter Hearingen kommer en sammanfattning att fastslås.

3. Utformning av program för hearingen

SJS och HN gör programdeklaration.

4. Programförslag för försvarsmaktens nanoteknikprogram

SJS och HN utarbetar ett förslag

5. Managementfrågor

Bordlägges till nästa möte

6. Inledande diskussioner angående författninga av (nanoteknik) programförslag

Bordlägges till nästa möte.

7. Kommande möten**:**

20 feb kl. 9.00-15.00 hos FMV utb. Sehlstetsgatan 9.

6-7 mars hos FOI Linköping hearing

19 mars hos FOI i Linköping kl. 8.00-14

Vid tangentbordet Hans Norinder

APPENDIX 1.22 Meeting notes 2003-02-20 AgNano meeting #19

Minutes from AgNano meeting #19

Date: 2003-02-20, time: 0900-1500, place: FMV, Sehlstetsg. 9

Meeting chairman: Sören Svensson
Meeting secretary: Steven Savage
Present: Hans Norinder; Anders Callenås; Michael Jacob;Lars Österlund; Rolf Dahlberg
Prevented from attending: Hans-Ove Görtz

The agenda was discussed and amended. Additional points to be discussed were:

1. A recommendation is to be made immediately after the hearing is closed as to the continuation of the nanotechnology program (or not). This is considered to be a request from HOG for "advance warning" (förhandbesked).
2. How should we handle secret projects? This question has been raised before, but the matter not completely resolved.
3. Can we/should we try to save any good ideas which do not rank highly enough as a separate project. (the question arises from HOG's e-post recently)?
4. How should the rejection letter be formulated? Individually, or a form letter? Should a motivation for the decision be given? When should the letter be sent? Can/should the referee's reports be included?
5. Who should be chairman during the hearing?

Some questions were reserved to be discussed if HOG could join the meeting later. Since this was not the case we did the best we could, but need comments/confirmation from HOG on some points, as noted in these minutes.

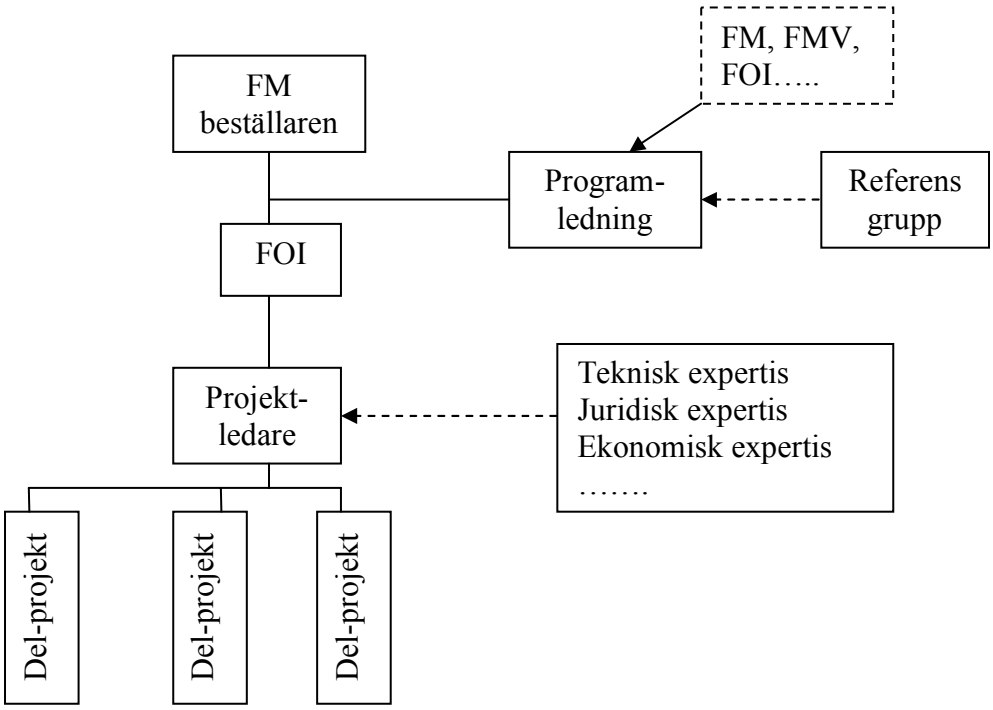
Minutes from previous meeting
Item #2. We decided that discussions and any changes to the earlier project evaluations would be treated as previously and not be a part of the minutes, but will be a separate attachment for AgNano only. HN (previous meeting secretary) will do this.
Item #6. "Inledande program" corrected to "inledande diskussioner angående författning av (nanoteknik) programförslag"
Item #7. "20 mars" corrected to "19 mars"

1. Program for hearing
We decided that in addition to AgNano only Ola Dickman (OD) from FMV will attend the secret hearing on 7 March. **NOTE**: HN to check if OD will attend also on 6 March (this is preferable). Does OD need a hotel room?
SJS has previously planned a program for the hearing. This was accepted for 6 March, but some adjustments were made for 7 March, to allow more time for the summing up. The revised program is attached (Appendix 1). (Note, I have spoken to Dennis Lundström, he accepts the revised time for his presentation, Peter Edman is not available, but I have e-mailed a request to him).
We discussed what we want from the international experts in terms of written/oral comments during the summing up. Immediate feedback to the presenter is also possible during the hearing. We decided that the experts should receive a list of questions, based on our original evaluation grounds, complemented by additional questions. These should be sent to the experts by Friday 28 Feb at latest. SJS to circulate the evaluation grounds (in English) on 21

Feb, comments and contributions from AgNano to be returned by 26 Feb (copies to AgNano). SJS will collate, if time allows circulate again to AgNano, if not send direct to the experts. (Note, evaluation grounds sent to AgNano yesterday evening).
During the summing up we would like a written consensus from the experts. Each project is treated separately (15 mins/project). One expert will present their findings (does not need to be the same expert for every project).
We decided to ask if HOG will act as chairman during the hearing. If not then RD will. We do not need to have the same chairman for the entire hearing, but a chairman is essential to maintain the timetable.

Immediately following the hearing we need to make a preliminary recommendation to HOG based on the quality of the applications received, based on the expert's assessments, based on the results of the hearing and based on our own judgement as to whether our recommendation is to proceed with the nanotechnology program or to break-off at this point.

2. Management of the nanotechnology program
RD and SS have previously spoken to HOG about this. HOG suggests that Phase I of the program, which is mainly research directed and with much UoH contact, should be managed by FOI. Phase II, which is expected to be directed towards development will involve more industry contact is therefore better managed by FMV. This was accepted.
A preliminary management structure was discussed. This is shown below.



We discussed costs for the nanotechnology program management, using approximate data from the Photonics program and previous experience. The average annual cost for managing the nanotechnology program during Phase I was estimated to be in the range 7-8% of the budget, or about 1.5 Mkr. Included in this are an annual review meeting (entire program plus external experts), regular meetings of the program group, program manager, travel and administration costs. NOTE, this discussion was only preliminary.

3. Balance in the program

This discussion was continued from the previous meeting. We decided that a good way to present the program is to sort the project applications invited to the hearing into two application areas: sensors and protection, as shown in the table below. NOTE, the project titles are abbreviated for convenience. Project numbers are also given.

Sensorer	**Skydd**
17 (MIP biosensorer)	3 (kerampansar)
18 (BioNanoLab)	7 (skydd mot lasar)
6 (THz)	12 (HT-RAM)
	14 (multispektral multispektral färg)
	15 (B/C destruction)

The program can be presented in various ways, depending on the purpose. Another way is to use the table on the next page. NOTE, this table is not complete; the FOI division involved is only of interest within AgNano and FOI, not for external readers. Some numbers need to be filled in, as do the various universities, companies, etc involved.

4. Preliminary discussions on the nanotechnology program proposal. How to present this?

Here we need guidance from HOG. What type of document is needed? A short and concise document (a few pages only) or a more comprehensive document containing all the background, and describing the processes we have used to arrive at our recommendations? We decided the following (confirmed later by HOG). Two documents are to be written, with different purposes and for different readers.

A. Program proposal, a short document aimed at FM (HOG, Christer Ramstedt, Jerker Fredholm, PG FoT…). We discussed this briefly, and wrote the disposition shown in Appendix 2. The first version, to be submitted to FM for a decision on the program will be in Swedish, later an English translation may be needed (for official purposes, and on the web).

B. Documentation of the processes we have used/developed during planning of the program. This is more for internal use, and to assist planning of any future programs similar to nanotechnology. If the Photonics program had been able to document the processes used we would have been able to benefit from this. It can also be used to refer to in the program proposal. This could be used as a deliverable (“milstolpe”) and a faktureringsunderlag from FOI (FMV).

5. Other questions

How do we treat secret projects? We have previously indicated no secret projects would be allowed. Have we changed the rules? Will this create difficulty? Specifically, one company does not wish it to be known they are active in the field in question (signature management). However, they are named, and the field of interest given in their open project application. We agreed to ask during the hearing if some parts of these projects can be open. This will facilitate review meetings, documentation, etc. Our international experts are informed that

there are secret projects called to the hearing. We can share all information with them, but this will be one way. The USA e.g. does not share information on signature management.

NOTE, a later thought from SJS, how do we treat this in the program proposal? We have decided that project titles and partners must be named specifically. After referral to HOG the following was decided: we ought to stick to our original idea – open (to attract as much interest as possible). So on the top of the project level everything is open. If needed the projects can be divided into sub projects and thus we can conceal secret projects if needed. This might be more of an administrative matter to handle if a project is 99% secret and 1% open.

Table showing the various partners in the program, the FMV KC and FM branch, university and industry participants.

Project nr	Project title	FOI avd	FMV/KC	FM gren	UoH	industri	Sum/ avdelning FOI	Kkr/år	% (av pengar ansökt om)
1	Energetic materials								
2	KE/RSV								
3	Nanoceramic ballistic protection	2	skydd	?	?	?	1500	1500	50%
4	C-nanotube ballistic protection								
5	Miniaturised fuel cell								
6	THz components	3	sensor/tele	?	?	?	1500	1250	50%
7	Sensor protection	3	sensor/tele	?	?	?	200	200	7%
8	Low energy surveillance								
9	Window materials with SAT								
10	Low observable hulls								
11	Concealing coat								
12	HT RAM	3	skydd	?	?	?	250	250	8%
13	Dynamic reflectivity photonbandgap								
14	Multispectral camouflage paint	3	skydd	?	?	?			
15	B/C destruction Photocat. coating	4	skydd	?	?	?	490	490	16%
16	Barrier materials								
17	MIP Biosensorsystem	4	skydd	?	?	?	500	500	17%
18	BioNanoLab	4	skydd	?	?	?	150	150	6%

Rejection letters.
We decided these should be sent as soon as possible after the hearing, they should be individual as far as possible, and they should contain a brief motivation for the rejection. (Michael's joke about the "balance" trump card was so good I feel it should be mentioned here!). The letter can contain an extract from our evaluation table showing the results of the Kepner-Tregoe model. It is possible that rejected proposers may ask to see the reviewer's comments (indications have been received to this effect). How do we handle this? Are the referee's reports open/secret? We decided that if a report is to be made available it must be registered at FOI. Can this be done with an anonymous document? SJS will check. (OK according to FOI registratur). Vetenskapsrådet make available anonymous reports, how do they do this? We decided that if possible we are prepared to make available anonymous reports to those proposers *who specifically request this*. We decided that SJS draft some letters, but these will not be sent until after the hearing.

Recommendation to HOG after the hearing
Two alternative formulations were prepared:

A. De inkomna förslagen är av sådan kvalité att planeringen kan fullföljas
B. De inkomna förslagen är av sådan kvalité att planeringen kan *inte* fullföljas

Following conslutation the following alternatives were preferred:

C. De inkomna förslagen är av sådan kvalité, att de möter de uppsatta kriterierna för urval, vilket medför att planeringen kan fullföljas
D. De inkomna förslagen är av sådan kvalité, att de inte möter de uppsatta kriterierna för urval, vilket medför att planeringen inte kan fullföljas

Hearing chairman?
We decided to ask HOG if he will accept this position. If not RD is prepared. The same person does not need to act as chairman during the entire hearing, the task can be shared. We need to obtain biographies of our international experts to use when introducing them. SJS will arrange this.

How do we save any good ideas which do not rank highly as a separate project?
This question arises from HOG's e-post question, and was previously discussed, but without coming to a conclusion at Södergarn. Are there any "guldkorn" in either the rejected proposals, or the previous short versions? We decided that each cluster leader will "dig as deeply as they think appropriate" into this, and bring a prioritised list of their findings to the hearing. Is there room in the program for small projects of an introductory character? Can/should we make room in the program for these ideas (if any)? This would allow more of a focussing (funnel effect) when we start Phase II.

Miscellaneous items raised

What if an offer of cooperation is received from e.g. one of our international experts? We decided that such offers are to be treated positively, but that no promises can be made until at least we have a nanotechnology program. Regarding the UK, it would be relatively easy for FOI to enter a cooperative agreement. It is likely to be more difficult with the USA.

Upcoming meetings
Hearings, 6-7 March, FOI Linköping
AgNano meeting #20, 19 March; 0800-1400, FOI Linköping

AgNano meeting #21, 4 April, 0900-1500, FMV Stockholm, location TBD

Steven Savage

APPENDIX 1.23 Meeting notes 2003-03-19 AgNano meeting #20

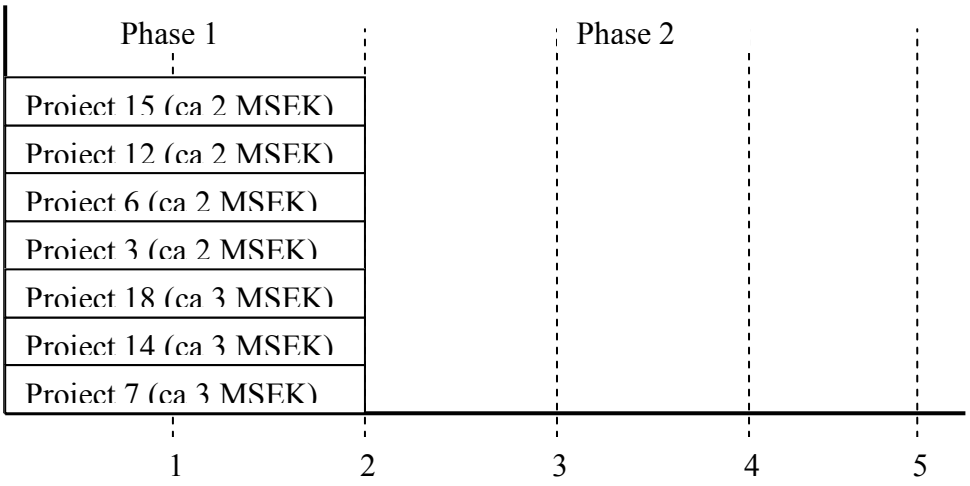
Minutes from AgNano meeting #20

Date: 2003-03-19, time: 0830--1400, place: FOI Linköping

Meeting chairman: Hans Norinder (HN)
Meeting secretary: Steven Savage (SJS)
Present: Anders Callenås (AC); Rolf Dahlberg (RD); Michael Jacob (MJ); Sören Svensson (SS); Lars Österlund (LÖ)
Prevented from attending: Hans-Ove Görtz (HOG)

The agenda was discussed. It was agreed that several items which overlap (4, 5, 6 and 8) should be treated together, an absolute order is difficult to determine as these items are interrelated.

1. Minutes from the previous meeting (#19) were discussed and approved with minor adjustments, principally to the programme management diagram.
2. No particular comments were made regarding the hearing. Feedback from those participating (both guests and presenters) has been positive. RD reminds us to be aware of spreading information which may have been obtained "in confidence" to avoid any potential embarrassment.
3. This item was superfluous as it is of necessity a prelude to item 4.
4. Each project application was discussed in detail. Our previous ranking order was reviewed in the light of comments received from the international referees, and other experts during and after the hearing. We decided that our original ranking was in the main correct. Differences between our ranking and that of the experts were noted and discussed. We agreed our programme proposal will be as depicted in the diagram below. Projects 7, 14 and 18 are accepted without modification. Projects 3, 6, 12 and 15 are not acceptable in their present form and must be complemented (see below).



Annual control stations that must be passed.

Responsible for producing the complementary information are:

Project 3: MJ max cost 100 kkr
Project 6 AC no cost allowance
Project 12 SJS no cost allowance
Project 15 LÖ max cost 50 kkr

This information to be received by SJS, deadline 17 April. This will incur some minor costs. It is unclear how these can be handled, but HN should look into the "reserve" at FMV. In the meantime write costs to E3903.
Inclusion of the above four projects in the programme is conditional on satisfactory complementation being received. These will be discussed at the next AgNano meeting on 24 April.

This should allow all the accepted projects to be started simultaneously, provisionally in September 2003.

5. The diagram above also contains provisional figures for financing each project. These are for guidance only at this stage. However this will reserve about 10% (2 Mkr) for managements costs, and allow the advance received in 2002 to be repaid.
6. This item is included in the diagram above. In summary: projects 7, 14 and18 are accepted "as is." Projects 3, 6, 12 and 15 may be accepted after revision. Decision to be made on 25 April. Provisional figures for financing as in the figure.
7. It was decided to notify the project coordinators of projects 3, 6, 7, 12, 14, 15, and 18 by telephone as soon as possible of our decisions. SJS to do this.
8. It was decided that project 17 is not accepted. The project coordinator to be informed both by telephone and by letter as soon as possible. Our motivation is that two applications have been received offering two different solutions to the problem of biological and chemical agent detection. The programme economy cannot support two approaches to the same problem, and we have determined the other approach to offer better possibility for success. All other applicants (i.e. those not short listed) should also be notified by letter. A motivation will be supplied if requested. SJS responsible.
9. It was decide that a skeleton outline of the programme proposal should be drafted by SJS and circulated by 31 March. We aim to have the first draft of the proposal ready and circulated by 24 April.
10. Next meeting. It was decided to retain the date slot 4 April in case we need a video conference (e.g. to discuss the programme draft, or results of the complementary information to be produced). Note, RD cannot attend. We agreed to meet again (meeting #21) at FMV on 25 April 0900-1500 to discuss the programme draft and make any necessary amendments. This must be delivered by 8 May (deadline for FMV). HN to arrange room.

In summary, some important dates:

Action	Deadline	Responsible
Skeleton of the programme circulated	31 March	SJS
Possible video conference	4 April	All except RD
Complementary information to SJS	17 April	AC, MJ, SJS, LÖ
Circulate draft #1 of programme proposal	24 April	SJS
Next meeting	25 April, 9-15, FMV	All

Delivery of programme proposal	8 May	All

At the keyboard

Steven Savage

Note added by SJS 2003-04-26. These minutes were approved without comment at AgNano meeting #21 on 030425

APPENDIX 1.24 Meeting notes 2003-04-25 AgNano meeting #21

Preliminary minutes from AgNano meeting #21

Date: 2003-04-25, time: 0900--1500, place: FMV, Sehlstedsg. 9

Meeting chairman: Hans-Ove Görtz (HOG)
Meeting secretary: Steven Savage (SJS)
Present: Anders Callenås (AC); Rolf Dahlberg (RD); Michael Jacob (MJ); Hans Norinder (HN); Sören Svensson (SS); Lars Österlund (LÖ)

The previously distributed agenda was approved with the addition of 3 items under "any other business". (1) förankringsprocessen – hur går vi vidare? (2) hur ser besked till 4 st projektberedare ut? (3) sändlista

1. The minutes from the previous meeting (#20) was approved without comment.
2. Four project applications were to be complemented with additional information. The additional information was received and circulated prior to this meeting. Each project was discussed individually.

2a *Ceramic-based nanomaterials.*

What had been requested was that the project application should be more focussed and specific. MJ presented this item. The supplementary information previously circulated was thought to be still too vague. What is needed is a "rak på sak" description of the applications, which include "ruggedised" sensor windows and ceramic components for personal protection (kroppsskydd). Additional information regarding specific project goals, including the measurement methods and specific material properties which are aimed for should be included.

After discussion it was decided to recommend that this project be included in the nanotechnology programme proposal. However, the supplementary information still needs to be refined. **MJ was delegated to do this.**

2b *Nanocomponents for the THz region*.

What had been previously requested was additional information and focussing on which specific applications were to be investigated, and what nanocomponents were to be demonstrated. AC presented this item. It was agreed that the proposed application "thru the wall" radar was an appropriate military need which could lead to a new military capability, and that to demonstrate a quantum cascade laser was an appropriate technical challenge which could be eventually used in a range of military equipment.

After discussion it was decided that the supplementary information answered our previous questions, but raised further queries as to:

- Is realization of a "thru the wall" radar system possible?
- Do the diode/transistor components to be studied in Phase I have suitable wavelengths?
- What (quantum cascade) laser performance is possible? (e.g. wavelengths, output power, etc)

It was noted that a related preliminary study is already funded from FOI (strategic research funds), due to be completed by November 2003, and that maybe this could be extended with additional funds from the same source to include the above questions. **AC was delegated to contact Bo Tarras-Wahlberg to see if this is possible**. (Note, this has already been done, the answer is no.) A further possibility noted was that FMV might be able to fund an extension of the preliminary study. **HN was delegated to investigate this.**

It was decided that despite these uncertainties this project had sufficient merit to recommend it be included in the nanotechnology programme proposal, with the condition that the above questions be answered before the project can be treated in the same way as other projects in the programme.

2c *High temperature materials.*

What had been requested was additional information regarding the suitability/credibility of the process techniques to be used; additional information as to potential health hazards (of nano-fibres); and the feasibility of performing some preliminary experiments before producing a ceramic-ceramic composite. SJS presented this item. After discussion it was agreed that the information provided gave satisfactory answers to these questions. However, the written document should be "sanitized" from some comments regarding the application and process details which could be too revealing for an open document. **SJS was delegated to do this.**

It was agreed that this project showed sufficient merit to recommend its inclusion in the nanotechnology programme proposal.

2d *BC agent decontamination.*

What had been requested was additional information on military applications for the materials this project will produce. LÖ presented this item. After discussion it was agreed that the applications presented were sufficiently relevant to recommend that this project be included in the nanotechnology programme proposal. It was noted that one objective of the project during Phase I should be a calculation of the potential (defence-related) economic consequences of the materials to be developed. No further action at this stage was required.

It was agreed that in the cases above where additional information needs to be provided (in several cases written) that this should be done as soon as possible, and at the latest communicated to SJS by 5 May.

It was agreed that the final, supplementary information will be collated with the appropriate project applications. When the planning process is completed all this documentation will be registered and (where this is not already the case) become publicly available.

3. Difficulties envisaged in funding and conducting secret projects have been resolved. Through direct contacts with those two projects concerned it has been agreed that the major part of both projects can be conducted openly. What should remain confidential (available only to the respective projects and FOI/FMV/FM) includes measurement results and e.g. process details which should not be made public if this could hinder a later patent application. A practical way to handle this is to limit the presentation of confidential information to appendices (to written documents), where the confidential appendices are distributed only to approved persons.
   We agreed that it is an unconditional requirement that FM has free access to all results and all materials and processes generated within the nanotechnology programme.

4. We discussed in detail the draft programme proposal previously distributed, and decided on considerable restructuring. What we aim at now is a short (ca 2 page) document with three appendices.

Headings in the main document are to be

1 Utredningens slutsatser
2 Programförslag
3 Ekonomi
Bilaga 1 Projektbeskrivningar

Bilaga 2 Utredningsgenomförande
Bilaga 3 Programorganisation

Bilaga 1 consists of single page (“enbladare”) descriptions of each of the 7 projects recommended for inclusion in the programme. These can be based on the short descriptions included in the first draft, extended to include more technical detail. An approximate layout is:

Titel
Förslagsberedning – beredaren och biträdande beredaren (tillhörighet) och de övriga deltagarna.
Projektbeskrivning, genomförande, m m
Försvarstillämpningar.

Bilaga 2 Utredningsgenomförande, ungefär som i utkast 1 med smärre modifiering. Ansvarig HN

Bilaga 3 Programorganisation. Består av avsnitt 3.4 + 3.5 i utkast 1

Ven gör vad?

HOG erbjöd sig att skriva texten till huvuddokumentet.
Bilaga 1 (d v s enbladaren):
”keramer” - MJ
”THz” - AC
”Laserskydd” - SS
HTM – SJS
MSCC – SS
”B/C dekontaminering” – LÖ
BioNanoLab – LÖ
I samband med framtagning av enbladaren skall alla även ta fram ett ppt bild som kan passa som del i en informations paket som används för att presentera programmet, t ex inom FM Deadline för detta = 5 maj. Skickas till SJS. OBS, skicka ppt bilderna som ppt, inte pdf, för då är det enklare att bearbeta till en presentation.
Bilaga 2 – HN ansvarig
Bilaga 3 SJS/HOG ansvarig, 3.4 och 3.5 från utkast 1 kombineras

5 Övriga frågor
5a ”förankringsprocessen” HOG informerar per mejl internt inom HKV (Johan Kihl, C. Ramstedt, m fl), FOI (B. Anderberg, Hans Elger…); FMV (S. Näsström…). Vi övriga informera de som vi tycker behöver vet om programförslaget (t ex avdelningscheferna, m fl). HOG ordnar ett möte med J. Kihl, ev. kan alla i planeringsgruppen delta.
5b besked till berörda projektberedarna (ang. nyligen fattad beslut). SJS informera telefonledes samt per brev. (OBS, redan gjort, de som inte svarade i telefon fick ett besked per mejl).
5c sändlistan ovannämnda personer samt övriga, HOG ordnar

Vid tangentbord

SJS

APPENDIX 2 List of initial project ideas

Kontrol -nr.	Kontaktperson	Titel	Doknamn	
1	Lundström, Dennis	Radarabsorberande lastbärande strukturer för hög temperaturer	Lundström.doc	
2	Larsson, Kerstin	MIP-sensorer för detektion av nervgaser och andra toxiska substanser	Larsson.doc	
3	Öhrström, Lars	Molecule-based magnetic materials	Öhrström.doc	
4	Olsson, Lars	Integration av mikrovågsantenner/datalänkar i struktuella applikationer/material	Olsson.doc	
5	Olsson, Lars	Krut och krutkonfigurationer med förhöjd prestanda	Olsson_1.doc	
6	Olsson, Lars	Skydd av material och vapensystem emot krutdegration	Olsson_2.doc	
7	Komstadius, Sven	Ytbeläggning med nanomaterial	Komstadius.doc	
8	Komstadius, Sven	Kylning m h a nanostrukturella material	Komstadius_1.doc	
9	Komstadius, Sven	Armerade Termoplaster	Komstadius_2.doc	
10	Hedborg-Karlsson, Eva	Reaktiva mesostrukturer för indikering av kemiska stridsmedel	Hedborg-Karlsson.pdf	
11	Hackström, Stefan	Optiskt aktiva material	Hackström.doc	
12	Oskarsson, Magnus	Flerfunktionella nanomaterial	Oskarsson.doc	
13	Österlund, Lars	Photocatalytic decomposition of toxic biological and chemical compounds on nanostructured materials	Österlund.doc	
14	Wikström. Per	Indikering och identifiering av kemiska och biologiska stridsmedel med chipteknologi	Wikström.doc	
15	Brandt, Jesper	Lastbärande lågsignaturmaterial av nanokerammatriskompositer (NCMC) för höga temperaturer	Brandt.doc	
16	Hjort, Klas	Real-time sensing artificial trained dog nose	Hjort.doc	

17	Hjort, Klas	Optical Remoting of Micromachined Antenna-Arrays	Hjort_1.doc	
18	Campbell, Eleanor	Cluster Ion Implantation for Nanometric Electrical and Magnetic Modification of Materials	Campbell.doc	
19	Andersson, Jan	**Q**uantum Dot Optoelectronic Components - QDOC	Andersson.doc	
20	Larsson, Christer	SANT (Signaturanpassning med nanoteknologi)	Larsson_C.doc	
21	Gedde, Ulf	Hybrid multiscale functional polymeric materials	Gedde.doc	
22	Eklund, Mats	Multifunktionella kompositer	Eklund.doc	
23	Bolton, Kim	Carbon nanotube based biochemical sensors	Bolton.doc	
24	Winkler, Dag	Icke-linjära sensorsystem för högre signal/brus-förhållande i störig miljö	Winkler.doc	
25	Winkler, Dag	Lågenergi-kommunikation för sensorsystem	Winkler_1.doc	
26	Winkler, Dag	RF-MEMS för: 1. Snabba switchade filter; 2. Biosensing på håll; 3. EMP skydd	Winkler_2.doc	
27	Kloo, Lars	Termoelektriska material	Kloo.doc	
28	Ström, Valter	Mjukmagnetiska nanomaterial	Ström.doc	
29	Ye, Lei	Bio-mimetic sensors based on nano-fabrication of molecularly imprinted polymers and biological receptors	Ye.pdf	
30	Fredriksson, Hasse	Framställning av nanokristalina material i bulkform	Fredriksson.doc	
31	Lopes, Cesar	“Tunable” ultra-fast protective filters against laser radiation – active protection against dazzle and jamming	Lopes.doc	
32	Alberius, Peter	Nanostructured hybrids in signature materials	Alberius.doc	
33	Edman, Peter	Autonom ändring av emissivitet	Edman.doc	
34	Larsson, Karolina	Funktionella nanofibrer - en ny ytbeläggningsteknik	Larsson_K.doc	
35	Edman, Peter	Multispektral Styrbar Yta	Edman_1.doc	
36	Vösu, Anne-Marie	Mikronavigeringssystem för extrema miljöer	Vösu.doc	
37	Hedenqvist, Mikael	Nano-polymerbaserade barriärmaterial som skydd för stridsgaser	Hedenqvist.doc	
38	Hedenqvist, Mikael	Nano-fiber armerade polymerer för mekaniskt	Hedenqvist_1.doc	

		krävande applikationer		
39	Jacobsson, Dan	Nanoteknik för antimikrobielll ytbehandling	Jacobsson.doc	
40	Andersson, Gert	Mikrobränsleceller	Andersson_G.doc	
41	Ribbing, C-G	Selektivt lågemitterande fotonstrukturer	Ribbing.doc	
42	Rudner, Staffan	Nanokomponenter för THz-området	Rudner.doc	
43	Valizadeh, Sima	Template synthesis of 1D Giant Magneto-Resistance (GMR) Multilayered Nanowires	Valizadeh.doc	
44	Valizadeh, Sima	Modelling and RF/Photonic Interface Engineering for Nano-Technology sensors	Valizadeh_1.doc	
45	Valizadeh, Sima	Cheap and disposable UV sensors	Valizadeh_2.doc	
46	Heszler, Peter	Nanomaterials for sensing applications against warfare agents	Heszler.doc	
47	Hult, Anders	Hyperförgrenade polymera material för IR tillämpningar	Hult.doc	
48	Eikman, Anders	Material med anpassade längtutvidgning (tailoting)	Eikman.doc	
49	Eikman, Anders	Elektrisk skärmning	Eikman_1.doc	
50	Eikman, Anders	Elektriskt tät kavitet	Eikman_2.doc	
51	Eikman, Anders	Multipeltransparenta material	Eikman_3.doc	
52	Eikman, Anders	Skydd av frekvensselektivt transparenta strukturer	Eikman_4.doc	
53	Eikman, Anders	Smörjningsfria (lager)material	Eikman_5.doc	
54	Malmström, Eva	Dendritiska polymera material för skydd mot laserpulser från ps till ms	Malmström.doc	
55	Nikolajeff, Fredrik	A versatile chemical biological individual sampler	Nikolajeff.doc	
56	Amandusson, Helena	Tunnelströmsaccelerometer	Amandusson.doc	
57	Rhedin, Henric	Exploderande kisel	Rhedin.doc	
58	Skrifvars, Mikael	Polymera nanokompositer för strukturella tillämpningar	Skrifvars.doc	
59	Olsson, Jan-Olof	Nanoteknik för SAT	Olsson_J-O.doc	
60	Holtz, Per Olof	Kvantpricksbaserad IR detektor	Holtz.doc	
61	Andersson, Rickard	Drag reduction	Andersson_R.doc	

62	Björkert, Stefan	Novel Tunable Photonic Band-Gap Materials	Björkert.pdf	
63	Chen, Weimin	Spintronic wide bandgap semiconductor nanostructures for THz applications	Chen.doc	
64	Nordin, Pontus	Ballistiska skydd	Nordin.doc	
65	Nordin, Pontus	Nanofiber - Smyg	Nordin_1.doc	
66	Nordin, Pontus	POSS	Nordin_2.doc	
67	Nordin, Pontus	Smarta ytskikt	Nordin_3.d	
68	Nordin, Pontus	Optiskt transparenta funktionsmaterial och strukturer	Nordin_4.doc	
69	Nordin, Pontus	Nanofiber - Elektrisk konduktivitet	Nordin_5.doc	
70	Nordin, Pontus	Nanofiberkomposit som strukturmaterial	Nordin_6.doc	
71	Lindmark, Björn	Anpassnings- och trimbara ultra-miniatyriserade antennelement för THz-tillämpningar__	Lindmark.doc	
72	Luo, Yi	Carbon based multifunctional materials	Luo.pdf	
73	Savage, Steven	Multifunctional polymer-based nanocomposites for military equipment	Savage.doc	
74	Lindgren, Mikael	Cooperation and information exchange with AFRL nano-program	Lindgren.doc	
75	Lindberg, Göran	Mikrobränslecellar, småskalilg kraftgenerering för portabelt bruk	Lindberg.doc	
76	Hammarström, Per	Development of biospectroscopic sensor for detection of biological warfare agents and infections	Hammarström.doc	
77	Björkert, Stefan	Ny teknik för hydroakustisk signaturanpassning	Björkert_1.doc	
78	Stemme, Göran	Hälso-övervakning och terapi baserad på en minatyriserad”genom-huden” mikronålsteknologi	Stemme.doc	
79	Björkert, Stefan	Mikrogasturbin och elektromagnetisk generator i kiselkarbid	Björkert_2.doc	
80	Oskarsson, Magnus	KE-projektiler och RSV inlägg tillverkade av nanostrukturella metaller/legeringar	Oskarsson_1.doc	
81	Bergh, Mats	NES in defence applications	Bergh.doc	

82	Parola, Stefane	Nanostructured materials for sensors, electronics and photonics	Parola/Savage.doc	
83	Willander, Magnus	ART-TAS	Willander.doc	
84	Stranneby, Dag	Reliability and failure mechanisms in microelectromechanical systems	Stranneby.doc	
85	Landegren, Ulf	Molecular tools and microsystems for biosurveillance	Landegren.doc	
86	Enoksson, Peter	Skiktade mikrooptiska system	Enoksson.doc	
87	Enoksson, Peter	RF circuits based on MEMS technology	Enoksson_1.doc	
88	Enoksson, Peter	Micro RPV (remotely piloted vehicle)	Enoksson_2.doc	
89	Enoksson, Peter	Miniaturised fuel cell	Enoksson_3.doc	
90	Enoksson, Peter	Optical amplifiers with dendritic nanomaterials	Enoksson_4.doc	
91	Mellander, Bengt-Erik	Nanomaterial för medeltemperaturbränsleceller av SOFC-typ	Mellander.doc	
92	Mellander, Bengt-Erik	Nanokompositer för litiumpolymerbatterier	Mellander_1.doc	
93				
94				
95				

APPENDIX 3 List of project proposals

Löpnr	Titel	Beredare	Tillhör.	Diarienr.	Prelim. Bedöm.	Inlämnade	
1	Energetic materials with improved performance	H. Östmark	FOI		Open	021118 (digital)	Digital utskrift lämnat till reg 021119
2	Nanostructured materials for KE…	M. Oskarsson	FOI		Open	021119 (digital)	Digital utskrift lämnat till reg 021119
3	Ceramics based materials for ballistic protection	M. Oskarsson	FOI		Open	021118 (digital)	Digital utskrift lämnat till reg 021118
4	C-nanotube based ballistic protection	A Järneteg					Anstånd 25/11 beviljat
5	Minaturised fuel cell	P. Enoksson	CTH		Open	021118 (faxed paper + digital)	Digital utskrift lämnat till reg 021119
6	Nano-components for the THz region	S. Rudner	FOI	02-2878 02-2878:2 02-2878:3	Open	021112 (original + digital)	Original lämnat till reg 021112
7	Sensor protection	E. Malmström	KTH		Open	021118 (digital + halv original)	Digital utskrift lämnat till reg 021119
8	Surveillance system	D. Winkler	Imego		Open	021118 (original, ej färdig + färdig digital	Digital utskrift lämnat till reg 021119
9	Window materials for signature management	P. Nordin	Saab		Secret	021118 (H-original, no appendix)	H-original till reg 021119 Meddelad 021119 per e-post att inkommer med

							öppen förslag
10	LOHM	M. Skrifvars	Sicomp				Anstånd 25/11 beviljat
11	Dentritic molecules for IR applications	Ö. Staaf	FOI		Open	021118 (original + digital)	Original lämnat till reg 021118
12	HT-RAM	D. Lundström	VAC		Secret	021118 (H-faxed + hand-carried)	Original lämnat till reg 021118
13	Dynamic reflectivity control	S. Björkert	FOI		Secret	021118 (H-original)	
14	Multispectral Camouflage Coating	P. Edman	Saab-Barracuda		Open	011118 (digital)	Digital utskrift lämnat till reg 021119
15	Biological and Chemical Agent Decontamination	D. Jacobsson	IM		Open	021118 (digital) OBS fel på ena filen Corrected 021119	Digital utskrift lämnat till reg 021119
16	"Nanotex" Biological and chemical agent barrier materials	M. Hedenqvist	KTH		Open	021118 (digital)	Digital utskrift lämnat till reg 021119
17	Bio-mimetic microsensor systems for detection of biological weapons	K. Larsson	Imego		Open	021118 (digital)	Digital utskrift lämnat till reg 021119
18	BioNanoLab	P. Hammarström	LiU		Open	021115 (digital)	Digital utskrift lämnat till reg 021118
19	Thermoelectric materials STRYKS!						
20	"Mikroturbiner"	K Hjort/S Björkert					

APPENDIX 4 A Brief Overview of the Process Leading to the Swedish Defence Nanotechnology Programme.

Appendix 4.1 Extract from the programme proposal (Bilaga 2 till Plan 23 321:32532/03

Utredningens genomförande

Särskilda FoT program

Nanoteknik i försvarstillämpningar ryms under rubriken ”Särskilda FoT program”. Eftersom dessa program är ett relativt nytt sätt att arbeta med FoT finns i dag ingen etablerad och dokumenterad process för programberedning. Planeringsgruppen har utarbetat detta programförslag efter följande process.

Arbetsgruppen AgNano

Första steget i planeringsprocessen var att ur FoT grupp 18 ”Materialteknik med elektronik och byggsätt” bilda en arbetsgrupp: AgNano, med medlemmar från HKV, FOI och FMV. Arbetsgruppen kompletterades efterhand med nödvändig vetenskaplig expertis från FOI.
Vid slutet av planeringsprocessen bestod gruppen av åtta personer, enligt nedan.

Övlt. Hans-Ove Görtz, HKV STRA PLANS PLAN, Försvarsmakten (Ordförande)
Övlt. Rolf Dahlberg, PLAN B, FMV
Tekn. Lic. Hans Norinder, KC Skydd, FMV
Lab. Anders Callenås, Forskningsområdesföreträdare, FOI
Foled. Sören Svensson, Inst. chef Signaturmaterial, FOI
Doc. Michael Jacob, Inst. chef Skydd och Material, FOI
Doc. Lars Österlund, Inst. Miljö och Skydd, FOI
Doc. Steven J. Savage, Inst. Signaturmaterial (Sekreterare)

Seminariedag

Eftersom kunskapen om nanotekniken och dess eventuella försvarstillämpningar behövde förbättras i svensk industri genomfördes ett antal seminarier, med syfte att förmedla vad begreppet nanoteknik innefattar. Ett 40’tal personer från olika företag, UoH, HKV, FOI och FMV deltog under en heldags seminarieserie. Föredragshållarna var främst från FOI, men även från UoH, företag samt FMV. Detta ledde även till en del kontakter mellan deltagarna, och stimulerade till tankar angående nanoteknik i försvarstillämpningar. Som ett resultat blev cirka 120 informella projektidéer inlämnade till AgNano.

Nanoteknik workshop

För att organisera och konkretisera dessa idéer anordnas en workshop under två dagar, där i princip alla som var intresserade bereddes plats att delta. Cirka åttio personer från företag, UoH, FOI, FMV och HKV deltog. Parallella grupper diskuterade idéerna, som var grovsorterade i sex intresseområden Efteråt ombads deltagarna att

inkomma med korta intresseanmälningar (Expressions of Interest, EoI) varefter cirka åttio sådana inlämnades.

Projektberedning
Efter sorteringen valdes från varje intresseområde ett eller ibland flera idéer för vidare bearbetning. Under ledningen av medlemmar från planeringsgruppen erbjöds ett antal personer (”projektberedare”) från UoH, FOI och företag att utifrån de inlämnade EoI inkomma med detaljerade projektansökningar, innehållande själva projektidén, mål, potentiella tillämpning (ar), ekonomi och tidsplaner. Arton stycken projektansökningar inlämnades.
Men hänsyn tagen till tidigare utarbetade värderingsgrunder, enligt nedan, bedömdes alla projektansökningar utgående från dess potential m h a Kepner-Tregoe modellen. Till hjälp användes även oberoende vetenskapliga experter från UK, USA, Tyskland och Sverige.

Värderingsgrunder
Följande värderingsgrunder utnyttjades vid bedömningen m h a Kepner-Tregoe modellen. Tabellen visar även viktningen av de olika värderingsgrunderna.

Värderingsgrund	Viktning
Nytta och förnyelse för FM	9
Genomförbarhet	6
Bas i civil FoU; andra drivkrafter	5
Andra drivkrafter	2
Nätverk, inkl FM*	3

* d v s hela försvarsorganisationen, inkl FM, FMV, FOI.

Hearing och beslut
Åtta stycken ansökningar valdes för presentation vid en hearing, inför planerings-gruppen och tre vetenskapsmän från UK och USA försvarsforskningsorganisationer (valda för deras vetenskapliga kompetens inom nanoteknikområdet samt deras insikt i och erfarenhet från försvarsforskning). Efter genomförd hearing, och i vissa fall begärda kompletteringar från några av projektberedarna fattade planeringsgruppen beslut om vilka projekt som kunde rekommenderas att ingå i FM nanoteknikprogram.

Parallella aktiviteter
Samtidigt som den ovan beskrivna processen pågick genomfördes ett antal parallella aktiviteter för att planeringsgruppen skulle kunna informera sig om nanoteknik i omvärlden. Dessa aktiviteter bestod av studiebesök och konferensdeltagande, och inkluderade besök till Japan (TRDI och Oxford-Kobe Institute), USA (Rensselaer Polytechnic Institute, NRL, ARL, ARO, AFOSR), UK (Defence Nanotechnology 2002) och diverse andra vetenskapliga konferenser. Även ett antal studiebesök till svensk UoH och industri har genomförts.

Sammanfattning
Slutsatserna som har dragits från studiebesök, resor och andra aktiviteter är att nanoteknik betraktas av andra försvarsorganisationer som ett mycket löftesrikt område inom vitt skilda tillämpningsområden. Det förutspås att nanoteknikens

möjligheter att framställa material med extrema kemiska, optiska, elektriska och mekaniska egenskaper kommer att ge försvars- och civila företag helt nya tekniska möjligheter. I ett flertal länder görs redan en mycket bred satsning på grund- och tillämpad forskning, och det finns flera exempel på nya funktioner (ex. sensorer) eller material (ex. energetiska material) för militärt bruk som grundar sig på nanoteknik. Det pratas öppet om målmedvetna satsningar på material för sensorer (kemiska, biologiska, infraröd, optiska, etc.) och skydd i vid bemärkelse i bl. a USA. Andra försvarsorganisationer ger intryck av att de inte har bestämt sig än för var de mest löftesrika tillämpningsmöjligheter finns, eller så pratas det i mer återhållsamma termer. Att det planeras för ett försvarsinriktat nanoteknikprogram i Sverige har ådragit sig uppmärksamhet och intresse, bl. a har ett antal erbjudanden om diskussioner rörande ev. samarbete emottagits.

De projekt som rekommenderas ingå i FM:s nanoteknik program har valts utifrån en syntes av många olika parametrar, bl. a de vetenskapliga och tekniska förutsättningar som finns på UoH och industri i Sverige. De finns ett antal forskaregrupper i landet som betraktas som mycket framstående, och flera av dessa knyts till programmet.

Att redan från början arbeta med s.k. integrerade projekt betraktas som det optimala sättet att införa ny teknik inom försvaret och industri, och bl. a. Vinnova har sagt sig vara intresserade av information om planeringsgruppens arbetssätt.

Källor

Vetenskapsmän i USA har under förberedelserna inför det nu välkända National Nanotechnology Initiative (NNI) gjort ett mycket omfattande utredningsarbete. Resultaten av detta arbete har använts tillsammans med annat material under beredningsarbetet.

Under hela planeringsprocessen har ansträngningar gjorts för att beakta viktiga vägledande dokument som Försvarsmaktens FoT strategi 2002 och Tekniska Utvecklingstrender.

Försvarsmaktens FoT Strategi 2002
Tekniska Utvecklingstrender (FMV 2001)
Materials Research to Meet 21st Century Needs (National Materials Advisory Board, USA, NMAB-498, 2001)
National Nanotechnology Initiative (National Science & Technology Council, USA, July 2000)
The Global Technology Revolution (RAND National Defence Research Institute, 2001)

Appendix 4.1 Description of planning process prepared for INTA, Spain (2003-11-30)

A Brief Overview of the Process Leading to the Swedish Defence Nanotechnology Programme.

Background

On the 1st October 2003 the Swedish Defence Nanotechnology Programme was launched. Planning activities for this programme started in the early summer of 2001, when it was proposed to look into the applications for nanotechnology in a future defence organisation. As with most, if not all defence organisations, the Swedish Defence Forces are faced with a new future, based on network centric warfare concepts. The Swedish Defence Forces of the future will be faced with new missions, which in contrast to those previously are likely to be met overseas, in countries with greatly different terrain and environmental conditions than those in Sweden. In addition, future missions are expected to be very different in character, with peace-keeping and peace-making tasks dominating. In terms of materiel functions, information gathering (surveillance) and armour are emphasised, so that materials for sensors and protection are prioritised.

Planning activities

Initial phase

The initial task was to evaluate the current status of nanotechnology, with two main objectives in mind: (a) to identify defence applications and (b) to determine if available solutions to these applications were mature enough to warrant investing in nanotechnology. This phase took about 6 months, and was performed by an ad hoc group consisting of four persons, from Defence Headquarters (HQ), the Defence Materiel Administration (FMV) and the Defence Research Agency (FOI). This study concluded that there were significant opportunities for nanotechnology in a future defence organisation, and that the field was mature enough to warrant investing in a major R & D programme.

Planning phase

Following the initial phase it was decided (by Defence HQ) to proceed with planning and preparation of a programme proposal. Funding for this was diverted from an existing project, also related to defence nanotechnology. This planning phase took approximately one year, and was performed by a working group of eight persons. The group was chaired by Defence HQ, with representatives from FMV and FOI. The work was led by FOI, which was necessary to supply the scientific insight into nanotechnology. During this stage study visits were made to defence organisations and academic institutions in the United States of America, and Japan.

Seminar series

Initially, contact was established with as many as possible of the scientists/engineers and companies active or interested in nanotechnology in Sweden. It was immediately realised that nanotechnology was a poorly defined subject, and the term had different implications for chemists, metallurgists, physicists, industrial scientists, etc. As is well known, there is no widely accepted practical definition of nanotechnology. To resolve this problem a series of seminars was held, with speakers mainly from FOI, but also from academia and FMV, Defence HQ and industry. The purpose of this was to present nanotechnology in terms relevant for defence applications. Titles of the lectures were:

- Defence oriented nanotechnology (introduction to the seminar series)

- What is nanotechnology? (in the defence context)
- Industrial applications of nanopowders and nanostructured materials
- Nanotechnology in sensor applications
- Signature properties of nanomaterials
- Nanocomposites in defence applications
- Mechanical properties of nanostructured materials
- Nanotechnology against chemical and biological weapons
- International activities

About sixty persons participated in the seminars. Following this activity, a call was issued for proposals to the planned programme. This resulted in about 120 expressions of interest (EoI's), many more than was expected. Naturally there were a number of EoI's which overlapped, and others which were complementary.

Workshop

After analysing the EoI's a two-day workshop was held, where about eighty scientists/ engineers participated. The purpose of this workshop was to bring together persons with similar or complementary ideas, and to allow these to be discussed and developed in the group. Delegates were divided into six working groups, according to their EoI. The groups were flexible, some persons moved from their assigned group to another which they felt more closely suited their interests. Each group was chaired by a member of the planning committee. After two days the results of these discussions were summarised briefly, and those present requested to present new and more carefully prepared EoI's. These were to be short (two pages) containing a central idea or problem, or application (relevant to future defence needs), with appendices as appropriate. This resulted in about eighty concrete proposals.

Analysis

These eighty proposals were sorted into the following groups:

- Bio and chemical sensors
- Communication
- Weapons
- Autonomous reconnaissance
- Signature management
- Energy (electricity generation and storage)
- Ballistic protection
- Bio and chemical protection
- Aperture materials
- Sensors (acoustic, electromagnetic, radar, etc)

Note that a proposal could be placed in more than one group. After this sorting it was found that some groups could be combined, so that weapons and ballistic protection were combined as both were concerned mainly with mechanical properties. Energy was eliminated as a separate group as this function is central in many applications. After this analysis, twenty scientists/engineers were invited to prepare detailed project proposals. The general application area was specified, but the applicants were free to select partners as they wished, to build an optimum project team.

Evaluation

From these twenty scientists eighteen project applications were received. These were evaluated using the Kepner-Tregoe model, with the following evaluation factors and weightings

Evaluation factor	Weighting
• Usefulness/defence relevance	9

- Plausibility 6
- Civil technology/expertise 5
- Network strength 3
- Other factors 2

This resulted in a ranking of the applications, which in some cases was clear enough to base an acceptance or rejection decision on. Each application was also refereed by a number of external reviewers, from Sweden, the UK and the USA. A hearing was held at which eight applications were presented. Following this hearing a final recommendation was made.

Security

Some of the final project applications were submitted as secret. This is an additional hinder, particularly in projects with several partners, some of which may be in academic institutions without appropriate procedures for handling secret documents. After discussion it was decided that the secrecy was only related to intellectual property rights and potentially patentable results, at least during initial stages. It was therefore decided that none of the projects needed be treated as secret during the initial stages.

Programme proposal

During May 2003 a programme proposal was submitted to Defence HQ. Each project is a network of three to six partners, from academia, industry and FOI. Some projects are led from a university, some from industry and some from FOI. The programme contained seven projects:

1. BioNanoLab (detection of biological and chemical weapons)
2. High temperature materials (structural radar absorbers)
3. Ceramic-based nanomaterials (apertures and ballistic protection)
4. Multispectral camouflage coatings
5. Nanocomponents for the THz region (“through the wall radar”)
6. Self-sanitising surfaces
7. Sensor protection (against laser weapons)

In addition, the proposal also contained a financing plan and management plan for the programme. The programme proposal was accepted for funding by Defence HQ in June.

Programme execution

The Swedish Defence Nanotechnology Programme started on 1 October 2003. The Programme will run for five years, in two phases. The Programme will be managed by a Management Committee of five persons, led by FOI and containing representatives from Defence HQ and FMV. Funding was approved for Phase 1, which will run for two years, until 30 September 2005. After one year, each project will be evaluated by a panel comprised of external reviewers and the management group. Projects which do not meet the required progress targets may be terminated at that time. After two years the projects will be reviewed again, and recommendations for Phase 2 (October 2005 to September 2008) made. It is likely that the number of projects will be reduced, to release funding for the remaining projects. The entire Programme has a fixed budget of 100 million Swedish crowns (approximately 11 million Euro). During Phase 1 each project has approximately the same funding, 3 million SEK or 330 000 Euro. In Phase 1 most of the available funding is appropriated for academic institutions (60%), with 20% of the funding going to industry and the remaining 20% going to the Defence Research Agency. This includes about 10% for management costs.

Programme objective
The Nanotechnology Programme has as its main objective to demonstrate nanotechnology in a number of defence relevant applications. These demonstrations will be of a scientific or technical principle or function, such as a material with properties suitable for a particular application.
Information dissemination
To distribute information about the Swedish Defence Nanotechnology Programme an internet based web portal has been created (www.nanotek.se). This will also be used during the programme for up- and down-loading progress reports and other information between the Programme Manager and the individual projects. The public part of this portal will also be used to disseminate information to the general public.
Spin-off
Several spin-off effects are expected from this programme, including:
Enhanced cooperation between FOI, industry and academia
Technology transfer to industry
Improved international cooperation