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Performance Report

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STAR
STRATEGY FOR ALLIED RADIOECOLOGY

EURATOM

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PU	Public	PU
RE	Restricted to a group specified by the partners of the [STAR] project	
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Executive Summary

This document constitutes the first Performance Report of the STAR project. The report covers the first six months of funding, beginning on 1 February 2011. STAR (Strategy for Allied Radioecology) is a Network of Excellence (NoE) in Radioecology funded under the EC's 7th framework. STAR is a consortium of nine partners from eight countries (Table 1) dedicated to strengthening the science of radioecology in Europe.

This Performance Report provides a brief summary of STAR's activities over the last six months. Highlights include:

- allocation of funds to all partners on 4 February, in time for STAR's Kick-off meeting in early March
- three major STAR meetings:
    - The first was a combined meeting of STAR's Work Package 2 (WP-2) and WP-6 held in Helsinki, Finland during mid-May. Topics included integration among partners, developing a strategic research agenda, establishing research observatories for common field studies, and a stake-holders meeting on education needs in radioecology.
    - A second meeting in Mol, Belgium during late-May focused on research WPs -4 and -5. External experts in mixed contaminants were invited to share their experiences and to offer suggestions on STAR's experimental plans.
    - A third meeting was held in Paris on 7 and 8 June and facilitated STAR's External Advisory Board's evaluation of our progress to date.
- several key communications (attached as appendices to this report), including
    - our first news letter,
    - a communication pamphlet about STAR,
    - a one-page advertisement on page 133 of the July issue of the EC magazine "Research Review". (http://www.theparliament.com/digimag/issue332)
    - STAR, and its parent platform (the ALIANCE), both made their respective websites public (www.star-radioecology.org and www.european-radioecology.org)
- introduction of STAR and the ALLIANCE to the larger radioecology community during two 1.5-hour sessions held at the International Conference on Radioecology in Hamilton, Canada (19-24 June).
- promotion of potential collaboration between radiation biologists and radioecologists. The benefits of such exchange were made to the DoReMi consortium by STAR's coordinator at a MELODI workshop (4 July)
- finalization of STAR's consortium agreement in mid-June
- STAR's decision to alter its plans for inviting new partners into the consortium, following Japan's Fukushima accident and subsequent conversations with STAR's EC representative. A direct invitation to a Japanese laboratory of radioecology was made in early May. The initial response from the laboratory was favourable. The Japanese lab has requested more time to fully consider the invitation.

- consulting services provided to STAR by five MBA students on the topics of integration and “change management”. Their suggestions provide business guidance on managing complex organizational changes. Their presentation to STAR’s External Advisory Board is provided as Appendix 6.5.
- evaluation of STAR’s first six months using Performance Indicators established within our Grant Agreement. Section 4 of this report details STAR’s progress in five key areas; research, information dissemination, education, integration, and management.
- STAR’s first report from its External Advisory Board. The EAB report is a key component to this Performance Review. Their findings (Section 5) did not include any fatal flaws or major problems. Several useful ideas were put forward by the EAB that will improve the probability of STAR’s success.

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1. Introduction

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Table 1. Partners within the STAR Network of Excellence

Partner full name	Short name	Country code
INSTITUT DE RADIOPROTECTION ET DE SURETE NUCLEAIRE	IRSN	FR
SATEILYTURVAKESKUS	STUK	FI
STUDIECENTRUM VOOR KERNENERGIE	SCK-CEN	BE
NATURAL ENVIRONMENT RESEARCH COUNCIL	NERC	UK
CENTRO DE INVESTIGACIONES ENERGETICAS, MEDIOAMBIENTALES Y TECNOLOGICAS-CIEMAT	CIEMAT	ES
STOCKHOLMS UNIVERSITET	SU	SE
BUNDESAMT FUER STRAHLENSCHUTZ	BfS	DE
NORWEGIAN RADIATION PROTECTION AUTHORITY	NRPA	NO
UNIVERSITETET FOR MILJO OG BIOVITENSKAP	UMB	NO

STAR is composed of seven work packages (WPs), three of which are focused on research (WPs -3, -4 and -5); others are focused on coordination of the NoE (WP-1); integration among the partners and developing a strategy for long-term sustainability of radioecology (WP-2); education (WP-6); and knowledge dissemination (WP-7). STAR has a website where more details about the NoE and individual WPs can be found (www.star-radioecology.org).

This particular report:

- provides a brief summary of STAR's activities over the last six months (*Figure 1*)
- provides an update on seeking new partners within STAR
- highlights an innovative management approach of using STAR as a consulting project by students from the IAE-Aix Graduate School of Management
- evaluates STAR's progress based on Performance Indicators established within the Grant Agreement with the EC.
- highlights STAR's first meeting of its External Advisory Board, and includes their evaluation and recommendations
- provides additional information within five Appendices:
    1. Manuscripts by STAR members, related to the Fukushima accident
    2. STAR's first Newsletter
    3. STAR's advertisement in the EU's "Research Review"
    4. STAR's communication pamphlet
    5. MBA students' presentation at STAR's External Advisory Board meeting

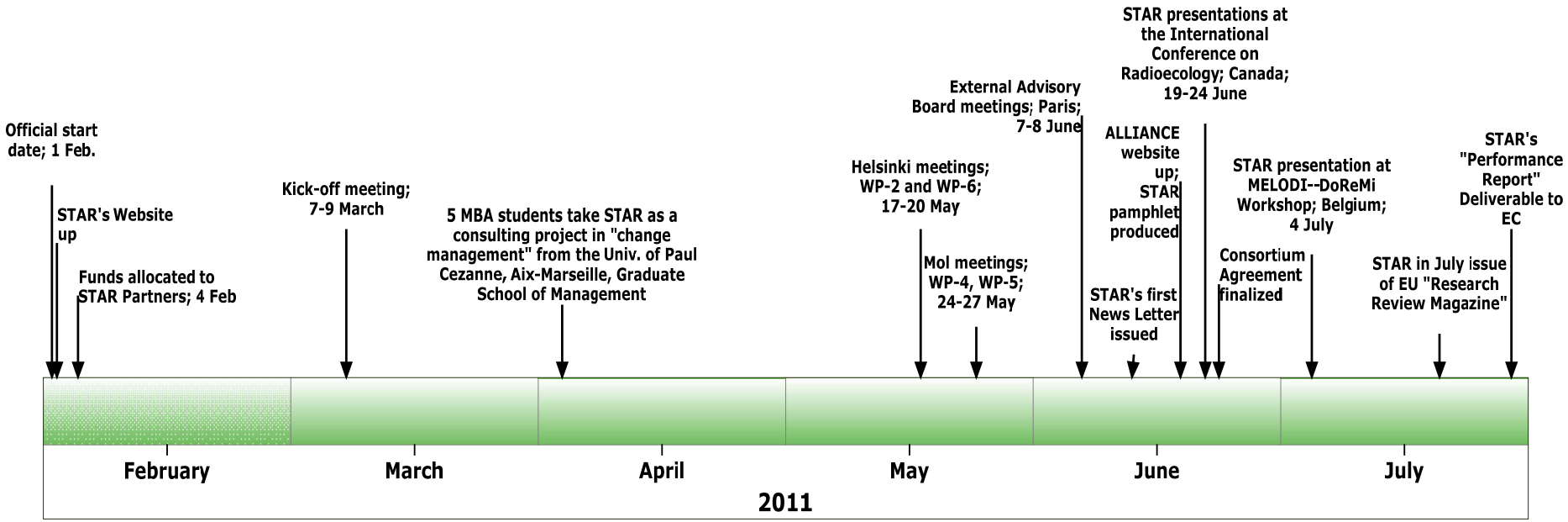


***FIGURE 1**. Timeline of major events within STAR during the first six months.*

2. Status of new partners

The STAR partners recognized the value of extending its membership and provided a means to do so within its Grant Agreement with the EC. The numbers of new members were limited by the EC recommendations and the amount of funds granted. A procedure for seeking new members was established in the Grant Agreement and involved an open call for proposals. STAR's External Advisory Board was to evaluate the proposals and make recommendations to STAR' Steering Committee.

Following the Japan's Fukushima accident of March 11, 2011, the EC suggested that STAR consider seeking a Japanese partner. This was viewed favourably by the existing STAR partners. STAR partners then offered suggestions as to likely candidate laboratories and debates of the pros and cons followed. STAR partners agreed upon a path forward, and the procedure of inviting a specific laboratory (rather than through an open call procedure) was discussed with our EC representative. An amendment to our Grant Agreement will be required once a Japanese partner agrees to join STAR.

The STAR members voted to invite a specific Japanese laboratory of radioecology into the STAR consortium. A letter of invitation was sent to the Japanese laboratory on 9 May 2011. Their response was favourable; however, the laboratory requested additional time to fully consider STAR's offer.

If the Japanese laboratory decides to pursue full membership with STAR, we will work with them in developing their own Action Plans, Milestones, Deliverables, Budget, etc. to meet the EC rules concerning new partners, and to smoothly align with the existing research programmes in STAR WPs -3, -4, and -5. Their plan would then have to be approved by STAR's Steering Committee and the EC.

Considering the complexity of the accident situation and the huge demands currently placed on the Japanese people and on Japanese radiological laboratories, we have not pressed the Japanese laboratory for a final decision to our offer of 9 May.

3. STAR as a consulting project of "Change Management"

A major goal of the STAR NoE is to develop "durable integration structures" among its nine partners. The integration will require organizational change that is complicated by large differences in culture, language, institutional goals, and modes of operating.

Many NoEs have been funded by the EC, but very few have successfully integrated at the organizational level. Evaluations of previous NoEs have indicated that full success is often limited by the inadequate integration among partners, and the coordinator's inexperience in managing such complex organizational change.

To assist STAR's integration, the coordinator approached the IAE-AIX Graduate Business School and offered STAR as a special project in "change management" for their pending

graduates to consider. The school specializes in “change management”, and the last project of the MBA’s academic year is to provide consulting services to an organization. The objective of the project is to give the students the opportunity to realize a consulting mission in a firm or an organization. The consulting missions deal with real change or transformation processes, either strategic, organizational, technological or human.

Businesses go to the school and present their “challenging problems”, and then the school and students choose which ones they want to work on as consulting projects. STAR’s coordinator made a presentation to the University about the challenges that STAR has relative to integration. Two weeks later we were told by the University that STAR was the project that received the highest interest among the students and that the school had to limit the team size to five. The presentation to the students was just after the Japanese crisis, and it was easy for non-scientific business students to see the relevance of what STAR is trying to accomplish. A link to the MBA program and the consulting project follows: http://www.mba-iae-aix.com/courses-sheet.php?id=133.

The MBA students have been reviewing STAR’s goals, attending many of our meetings, and providing consulting advice. An MBA student presented their work to STAR’s External Advisory Board. The EAB’s favorable response is included in their report (Section 5).

A final report and analyses of an MBA-generated survey of STAR partners is pending. The conclusions of the MBA consulting project will be reported within the next Performance Report to the EC.

4. Performance Indicators

Performance indicators (PIs) were established within STAR’s Grant Agreement with the EC to help evaluate STAR’s progress and success. The PIs are divided into five categories within the following tables (1- Research; 2- Dissemination; 3- Education; 4- Integration; 5- Management). Success factors are listed in the first column of the table. The second column provides the performance indicators, listed in STAR’s Grant Agreement, that are to be used to evaluate success, and the third column provides a six-month status report for each respective performance indicator. The External Advisory Board also evaluated the strength of the PIs listed within our Grant Agreement. The EAB recommendations are found in section 5 of this report.

4.1 Research

SUCCESS FACTOR Research Oriented	PERFORMANCE INDICATOR LISTED IN GRANT AGREEMENT	SIX MONTH PROGRESS
I. Relevance of research	1. Research is focused on key issues identified by the ALLIANCE Strategic Research Agenda (SRA)	1. STAR's three research lines are focused on topics identified within the draft SRA of the ALLIANCE. The research lines were chosen because of their complexity and difficulty for a single laboratory to accomplish. The research will assist in the integration of the STAR partners.
	2. Research results are published in well-respected, peer-reviewed journals (based in part on impact factor of journals)	2. Research is beginning, no publications at this early stage.
II. Exploitation of results by end-users	1. Open interdisciplinary workshops	1. WP-4 and WP-5 held a workshop on multi-stressors, DEBtox-theory, and "-omics" in which six experts from disciplines outside of radioecology were featured (25-27 May 2011). WP-6 held a workshop (19-10 May) on stakeholder needs for radioecology.
	2. International collaboration	2. STAR has invited an internationally known radioecology laboratory in Japan to be a partner.
	3. Number of attendees to workshops	3. Workshops WP-4 and WP-5, mentioned in #1, were attended by 31 persons + 6 experts; workshop WP-6 was attended by 33 representatives from regulators, industry, international organizations, other networks of excellence, and consultants.
	4. Collaboration with EU- and international projects	4. Several STAR partners are involved in the IAEA EMRAS project. Suggestions for working groups for the follow-up programme to EMRAS II have been submitted by some STAR partners to the IAEA and would complement and enhance some of the research activities of STAR .
III. Observatories for Radioecological Research	1. Establishment of sites	1. STAR held a workshop on Observatories in mid-May. The workshop goals were to complete a preliminary list of criteria for selecting sites and to address the problem of weighting criteria.

SUCCESS FACTOR Research Oriented	PERFORMANCE INDICATOR LISTED IN GRANT AGREEMENT	SIX MONTH PROGRESS
	2. Communication of their potential to the wider scientific audience	2. The Observatory concept was presented to the wider radioecology community at the ICRER meeting in Hamilton, Canada; June 19-24, 2011.
	3. Number of participants outside of STAR	3. At this early stage, no sites have yet been declared, thus no external participants.

4.2 Dissemination

SUCCESS FACTOR Dissemination Oriented	PERFORMANCE INDICATOR LISTED IN GRANT AGREEMENT	SIX MONTH PROGRESS
IV. Wide dissemination of high-quality results	1. Number of original publications	1. No publications at this early date that are specific to STAR research; however, several publications relative to the Fukushima accident in Japan have been published by STAR participants (see APPENDIX -1)
	2. Number of visits to public web site	2. Public web site was established in mid-April 2011. It is one of the top relevant sites identified on Google searches for Fukushima related issues. The site has been viewed over 900 times, peaking at about 60 views per day.
	3. Number of press releases	3. A press release within several internal websites of STAR partners occurred shortly after our kick-off meeting; a press release of STAR and the ALLIANCE occurred just prior to the International Radioecology Conference in Hamilton, Canada; a one-page advertisement in the EU Research Review is in their July issue; our first Newsletter was published in mid-June and is on our website; a pamphlet on STAR was published in mid-June and distributed at the Hamilton meetings and at a MELODI-DoReMi workshop in July; the ALLIANCE website was started in mid-June (links and copies of all of the above are provided in the APPENDIX, and are also on our STAR website). Two 1.5 hours sessions, specific to STAR and the ALLIANCE were held at the Hamilton meetings in Canada.

SUCCESS FACTOR Dissemination Oriented	PERFORMANCE INDICATOR LISTED IN GRANT AGREEMENT	SIX MONTH PROGRESS
V. Data management	1. Effective use of internet in establishing public accessible data bases	1. STAR has a public web site: www.star-radioecology.org. Newsletter and flyers are available for public. Data bases have not been established at this early date. The CEH Spatial Gateway has been identified as a suitable vehicle for data access. The ALLIANCE has a website (www.european-radioecology.org).

4.3 Education

SUCCESS FACTOR Education Oriented	PERFORMANCE INDICATOR LISTED IN GRANT AGREEMENT	SIX MONTH PROGRESS
VI. Educating young scientists	1. Number of education and training courses	1. STAR is developing training modules in WP-6.
	2. Number of MSc and PhD theses	2. STAR has 1 MSc student (at Stockholm University) and 6 PhD students (2 at SCK-CEN, 2 at IRSN, and 2 at SU) that will work on our projects. Five MBA students are using STAR as a special consulting project in "change management"
	3. Number of students entering and passing; feedback from students	3. It is too early in the program for this PI.
VII. Improving the competence of NoE partners	1. Arranging specialist workshops	1. A specialist workshop was held in Mol, Belgium, organized by STAR partner SCK-CEN, on multiple stressors, DEBtox theory and applications (25-27 May 2011).
	2. Number of attendees	2. 37 attended
	3. Feedback from attendees	3. Nina Cedergreen, an invited expert to the workshop, as well as a member of STAR's External Advisory Board, said that she was impressed with STAR's openness to other expertise and that we are actively seeking knowledge outside our traditional areas.
VIII. Contribution of STAR to science policy	1. Incorporation of STAR-generated results into National and International forums	1. It is too early for this to occur

4.4 Integration

SUCCESS FACTOR Integration Oriented	PERFORMANCE INDICATOR LISTED IN GRANT AGREEMENT	SIX MONTH PROGRESS
IX. Researcher mobility	1. Number of visits to other partners/labs 2. Ease of access to shared infrastructures	1. Visits were made to the IRSN facility by those attending the STAR kick-off meeting, and visits to the STUK research facilities were made during the WP-2, WP-6 meetings in Helsinki. 2. This is a key component to WP-2 and is being initiated by first doing an inventory of the facilities that the various partners possess.
X. Integration of R&D activities	1. Number of new members to the ALLIANCE 2. Number of joint publications 3. Number of joint research projects	Items 1, 2 and 3: It is too early for these PIs to have occurred. The ALLIANCE was presented to the wider radioecology community for the first time at the ICRER meeting in Hamilton, Canada. (June 19-24, 2011), and an ALLIANCE website is now public.
XI. Sustainability after EC funding	1. Effective merger of STAR into the ALLIANCE 2. Effective response to other calls for proposals 3. Expansion of ALLIANCE with new members	Items 1, 2 and 3: It is too early for these PIs to have occurred. The ALLIANCE was presented to the wider radioecology community for the first time at the ICRER meeting in Hamilton, Canada (June 19-24, 2011)

4.5 Management

SUCCESS FACTOR Management Oriented	PERFORMANCE INDICATOR LISTED IN GRANT AGREEMENT	SIX MONTH PROGRESS
XII. Efficient and transparent decision making	1. Regular Steering Committee meetings and continuous interaction with partners	1. The STAR partners have declared their representatives for the Steering Committee. The Committee's first meeting will occur in September, 2011.

SUCCESS FACTOR Management Oriented	PERFORMANCE INDICATOR LISTED IN GRANT AGREEMENT	SIX MONTH PROGRESS
	2. Evaluation by External Advisory Board	2. The EAB evaluated STAR at a meeting on 7 and 8 June; their report is included
	3. Timely publication of agendas and minutes on website	3. All agendas and minutes to meetings have been promptly posted on the STAR website.
XIII. Efficient and transparent operation	1. Feedback from management team and steering committee meetings; feedback from External Advisory Board.	1. The External Advisory Board met for the first time on June 7 and 8. Their report is attached to this document. The first meeting of the Steering Committee will be in September.
	2. Accessibility of coordinator;	2. The Coordinator is easily accessible via e-mail and phone
	3. Effectiveness of coordinator;	3. A survey instrument was prepared by the MBA students using STAR as a consulting project in their "change management" courses. Some questions on the survey are in regard to the coordinator. Results will be available at the next reporting period.
	4. Timely publication of agendas, minutes	4. Agenda and minutes have been published in a timely manner and placed on our website
XIV. Coordination with EC	1. Effective communication with EC	1. Communication has been effective with the EC on all STAR related items. Including some rather unusual ones such as the potential of adding a Japanese partner, following the Fukushima accident.
	2. Obligations delivered according to the Grant Agreement	2. Our deliverables have been sent to the EC within the 60-day period following the due date, as allowed by the EC.
XV. Financial Aspects	1. Prompt allocation of funds to partners	1. Funds were promptly allocated on 4 Feb. 2011; 3 days after start date
	2. Transparent record keeping	2. All relevant documents are posted to STAR website
	3. Effective use of flexibility budget	3. To date, there has been no use of the flex funds.

SUCCESS FACTOR Management Oriented	PERFORMANCE INDICATOR LISTED IN GRANT AGREEMENT	SIX MONTH PROGRESS
XVI. Develop a culture of team spirit with high ethical standards	1. A survey will be designed to query STAR participants on an annual basis. The survey will target questions that pertain to team spirit and ethics. 2. An on-line short course will be developed to teach ethics in science to students and young professionals	1. The survey was being developed by MBA students from IAE-Aix University, and includes questions about "change management and integration". It is currently being circulated to STAR participants. The results will be available at the next reporting period. 2. Material is being collected for the course, based largely on the ethics course already taught by D. Oughton at UMB, Norway.

5. External Advisory Board (EAB)

The External Advisory Board of STAR, as approved by the EC, is composed of seven experts (*Table 2*). Three members were chosen specifically outside the discipline of radioecology so that they could provide guidance on STAR activities that are beyond traditional radioecology.

The board members have been chosen based on their expertise relative to seven categories of activities conducted by the various work packages within STAR.

1. *Risk assessment* (relevant to WP-3)
2. *Contaminant mixtures* (relevant to WP-4 and -5)
3. *Modelling / Statistics / Systems Ecology / Alternative modeling methods* (e.g. Baysian) (relevant to WP-3, -4 and -5).
4. *Integration expert / development of strategic research agenda / road map development / performance indicator specialist* (relevant to WP-1 and -2)
5. *"-omics" expert / population ecology / ecotoxicologist* (relevant to WP-4 and -5)
6. *Education specialist / use of web-2.0 / syllabus development / stakeholder participation specialist / recruitment specialist / knowledge management* (relevant to WP-6 and -7).

The EAB meetings were scheduled within STAR's Grant Agreement for months 4, 18, 36 and 54. The first meeting scheduled for month 4 (May) was delayed due to the difficulty of finding a time commonly available for the committee members. The first meeting was thus held on 7 and 8 June, 2011. A report of each EAB meeting is a Deliverable to the EC, and the report of the EAB's first meeting constitutes a large part of this document.

In addition to evaluating STAR's overall success (based on the performance indicators listed in the previous section) the EAB has three GO-NOGO decisions relative to the research in STAR's Work Package-4 and WP-5. The EAB will approve:

1) the integrated experimental research plan for WP-4 and WP-5 (subtask WP-5.1.2);
2) STAR's choice of biomarkers and "-omic" tools as proposed in Task 5.1.2;

3) the use of the DEB model for further studies, based on preliminary results generated by STAR (WP-5.3).

Table 2: External Advisory Board members

EAB Member	Position / Institute	Expertise
Rick Jones	Former Chairman of the OECD/NEA Committee on Radiation Protection and Public Health (CRPPH) and former head of the Radiation Control Department at the US-DOE.	Radiation protection; public health; science management
Mikhail Balonov	Head of Protection Lab, Institute of Radiation Hygiene, Petersburg, Russia	Radiation biology; Chernobyl Forum; ICRP member, formerly with IAEA
Nina Cedergreen	Department of Basic Sciences and Environment Faculty of Life Sciences, University of Copenhagen, Denmark	Ecotoxicology; chemical mixtures; dose-response modelling; science education
Dick Roelofs	Department of Animal Ecology, Vrije Universiteit, Amsterdam	Gene expression profiling and ecotoxicogenomics
Valery Forbes	Director, School of Biological Sciences, University of Nebraska, Lincoln, USA	Ecotoxicology; science education; science management; statistics
Maria Betti	Director, IAEA Environmental Laboratories, Monaco	Radiation chemistry; radioecology; science management
Satoshi Yoshida	Research Center for Radiation Protection, National Institute of Radiological Sciences (NIRS), Chiba, Japan	Radioecology; science management; Asian Network of Excellence in Radioecology; International Union of Radioecologists

5.1 Report of the STAR External Advisory Board

(*Compiled by EAB member R. Jones*)

Introduction

The members of the STAR External Advisory Committee met in Paris, France, 07 and 08 June 2011, to conduct its first meeting. The STAR participants provided briefings on the intent and status of each of the seven Work Packages. The below comments are provided based upon information provided during the briefings and the EAB members review of the document entitled: "Seventh Framework Programme, Theme [Fission-2010-3.5.1][An integrated approach to radioecology research in Europe]. This report is being submitted in support of Deliverable D1.1, "Performance Report" to be forwarded to the EC.

Feedback on Performance Indicators (PI)

The PI are good management metrics, but are not really performance indicators. Most of them do not address the value added and demonstrate how radioecology will be advanced and made more self-sustaining through the conduct of STAR. One way to develop more appropriate PIs is to go back into the grant agreement and look at STAR's objectives and goals and create PIs that answer the question: "What is the value added by this workpackage?".

One example could be the first PI under Education. Here first a baseline of existing courses, numbers of MSc and PhD students trained in radioecology should be established. And then the PI should state quantitatively (by number of courses, MSc and PhD students) and qualitatively in terms of quality of courses (mobility of teachers and students) how STAR improves upon the baseline.

Another example of an indicator is given on Part B, page 7, where it is stated, "improving extrapolation methods and reducing the level of their associated uncertainties is the major objective of STAR's third research line". So a possible PI is to demonstrate that STAR's research has reduced the uncertainty and then explain why that is important, i.e., what is the value added by doing this.

We recommend that the team revisit the grant agreement and try to identify more value added indicators and submit them to the EAB for review at their earliest convenience. For the quantitative indicators, it may be necessary to gather baseline data in order to demonstrate STAR's impact; the team will need to consider whether baseline information is available. In addition, The EAB suggests that the PIs be responsive to the lists of comments from the EC concerns expressed in the Negotiation Mandate CONCERN-24.

The EAB believes that revising the PIs as suggested above would be valuable to the management of STAR to focus its activities and it would be valuable to the EC to demonstrate the value added of funding this research.

General Comments

The EAB finds it very positive that the project has drawn on the expertise of the MBA students, and we find their input very valuable. The EAB recommends that the project continues to utilise this expertise to assist in the efficient and effective management of the program. The EAB thinks, as do the MBA students, that the project would benefit from an enhanced feeling of urgency in identifying and prioritising work activities. Prioritising so as to identify a common vision for the STAR members will enhance successful management of the program. The project should also look to identify "quick wins" and "small successes" that can be jointly celebrated among the members.

STAR has indicated that it wants to develop a proactive communication plan. This was going to be accomplished primarily by using web 2.0 technologies. In developing the plan the program should identify stakeholder information needs and then proactively push or send the stakeholders information of interest to them as it becomes available.

It was a little unclear to the EAB how work activities would be prioritized, what their interrelationships would be, and how they were going to be integrated. For example, it would appear that WP3 would benefit from more interaction with WP4 on the exposure side and WP5 on the effect side.

Work Package (WP) 3 and 4 [*editorial note from T. Hinton: the WP numbers are a typographical error; this paragraph actually refers to work packages 4 and 5*] are huge, and should be prioritised and resources dedicated accordingly, with primary focus on achieving value added results. More effort should be given at this time to really creating hypotheses for all the research activities, which will then define the research needs. In focussing activities the EAB recommends that STAR contact experts within "omics" to determine if omics is the right tool to address the hypotheses proposed and whether such an approach will really address the questions proposed and contribute added value. Both work packages address issues that have been in focus for some time in the field of ecotoxicology. STAR provides the potential for synergistic interactions between radioecologists and ecotoxicologists that should be exploited for the benefit of both fields.

The expert workshop for WP4 was good, and the involved STAR partners were very responsive to inputs. In general the STAR participants are very open to input which the EAB sees as very positive for the project.

Part B, page 12, phase 3 of the project commits to a transition plan. It is not apparent that the transition plan is listed as one of the project deliverables. The EAB find this problematic as the long term sustainability of this project is one of the main goals. The EAB is very interested in monitoring the development of the transition plan.

Specific Work Package (WP) Comments

WP2: The WP is important to the success of the entire program of work, hence the EAB thinks the links to the other WPs need to be strengthened. The virtual laboratory package should be better described (i.e.,, what is it and what is its purpose?). It was not clear how it will be used. For example, will it include work that has already been accomplished, such as Chernobyl, or will it only include new sites? The connection with the Fukushima people would be useful for demonstration of future demand on radio-ecology research. It needs to be made more clear what it is that needs to be integrated and what the virtual laboratory's relationship is to the Strategic Research Agenda. Which kinds of infrastructure should be developed and among which partners, only STAR or the entire Alliance?

One of the objectives of task WP2.3 is to standardize QA systems and database management. This seems a concrete and significant benefit that STAR can deliver for the whole research community.

WP 2 has a specific objective to produce the long term Strategic Research Agenda; the inventory of the infrastructure including databases and sample archive; the plan of long-term integration as well as a "European Observatory." Specific PIs should be developed for all these objectives.

Overall, the WP is not clear in what should be included, how it is going to be used and how radioecology and the related sciences would benefit from this level of effort.

Since there have now been many European network projects that have had integration and joint use of infrastructure as goals, STAR could benefit from the successful (and unsuccessful) processes and models used in some of these other projects. One program that may be relevant to consult in this regard is the BONUS program (http://www.bonusportal.org/).

WP3: The WP would benefit from greater clarity on work activities, goals and contribution to advance environmental radiation protection. The EAB was surprised that the project is not proposing to use existing European models created in the framework of other EC projects such as ERICA and FACCET. [*editorial note from T. Hinton: typographical error, FACCET should be FASSET*] According to the presentation, focus is going to be on the improvement of dosimetry for wildlife. However, there were no indications of addressing the key issue of environmental radiation protection. The WP needs to identify the system or approach for the environmental system before going into details on improving dosimetry and models on individual species. The methodology for integration of the human and environmental radiation protection systems was not at all clear and will need to be defined before any research activities are initiated. Whereas integration of human and wildlife exposure would seem very sensible, integration of effects is questionable given that the targets for protection differ widely between humans and non-human populations.

In summary, the EAB would like to see a more explicit explanation of the added benefit of merging the two systems and an indication of who will benefit from such a merger.

WP4: The work package should be strongly prioritised, and focus should be given to a few exemplary binary mixtures, chosen based on modes of action. If molecular tools are seriously considered, available molecular mechanistic information should also be considered (e.g. gene expression studies). Focus should be on understanding the mechanisms behind the possible interactions so that the conclusions could be extrapolated to a more general level. A major challenge will be to ensure that the conclusions derived from this research can be generalised conclusions. A suggestion can be for expression analysis to select stress response genes belonging to pathways that are evolutionary conserved among the test organisms. A comparative analysis would reveal if these pathways are affected in the same way among the diverse models.

As there is already a large experience on mixtures of chemicals in the ecotoxicological literature, a “non-invasive” ROS stressor, such as radiation, could also provide added value to the general understanding of chemical and abiotic stress to organisms. Using information on mechanism of action, it should be possible to create mixtures that are most likely to result in synergistic, antagonistic, or additive effects.

The “Something for nothing” hypothesis could be reformulated to “Do mixtures of radiation and chemical stress follow CA or IA”,- or something similar, since this is essentially what is being tested when assessing the effect of multiple chemicals at low statistically insignificant doses.

WP5: The WP is very ambitious, and the team needs to seriously prioritise what is possible to accomplish within the framework of the program. The EAB finds it unrealistic to do both mechanistic studies investigating effects from gene expression to population and community levels AND also address the question as to why there is such a large difference in radiosensitivity among species. The research needs to be organised in hypothesis-driven steps that will ensure productive outputs along the timeline.

Justification for using DEB-tox (to gain understanding of impacts of radiation on physiological energetics) and population modelling (to mechanistically link effects of

radiation on individuals to effects at higher levels of biological organization) is clear. However, the expected contribution of the "omics toolbox" seems unclear, and more consideration needs to be given to whether and how such tools can contribute to the project's overall goals. It is also unclear which of the participant(s) holds the genomics/bioinformatics expertise to successfully integrate this part. The EAB suggests that the "omics' tools, if used at all, should be restricted to testing selected and strategic hypotheses that can provide mechanistic understanding of radionuclide impacts at the molecular/biochemical level. The large body of available literature on molecular consequences of radiation should be helpful in formulating such hypotheses. As suggested above for WP4, a comparative approach to study evolutionary conserved pathways may also be valuable for WP5

WP5 participants are currently selecting species for study. Whereas the DEB-tox experimental work will, for practical reasons, need to be restricted to species with relatively short generation times and that can be kept in the laboratory, the population modelling could potentially include long-lived vertebrates for which baseline ecological- and life-history data are available from the published literature. If there is any information on wildlife impacts at contaminated field sites, these could be usefully employed in such modelling.

WP6: It was unclear whether the Master program proposed was a one-year program designed for students who already have an M.Sc. in related disciplines or whether it was a 2 year M.Sc. for students with a related BS. It should be made more clear, who the targets are for the different educational programs and courses and what the structure and extent of proposed education is. Is it a full MSc program, or is it courses that will be built into an existing MSc program. If the latter is the case, which program? What is the extent of elective courses, mandatory courses and project work expected to be? And, how much time and energy will be devoted to the MSc program versus PhD courses and workshops? The quantity and quality of the educational program is not stated clearly in the PI. Neither is the expected numbers of participants.

The EAB feels that a more multi-disciplinary approach to enhance radioecology expertise would be productive. Hence, a Master program for students that already have a strong discipline with an M.Sc. degree, we find would be the strongest contribution to radioecology. The EAB feels that a one-year program given to people that already have a strong discipline would be the quickest way to produce more radioecologists and in addition will ensure a sufficient high disciplinarity of the candidates. We emphasize the importance of using the expertise within the STAR program in the courses as already proposed and for the students to do projects within the STAR organisation. This will promote both integration and knowledge exchange between the institutions. We think it is a good idea to do the joint degree with the French university.

The program could benefit from communicating with international organisations and research institutes and universities working in radioecology outside Europe. It could also benefit from knowledge exchange with other cross university and interdisciplinary education programs. A list of joint MSc programs, their organisation and contact persons as presented at the University of Copenhagen, Dept of LIFE Sciences are given here : http://www.life.ku.dk/English/education/msc_programmes/International_MSc_Programmes.aspx

WP7: The program should identify stakeholder information needs and then proactively push or send the stakeholders information as it becomes available. The team needs to consider how they can document the value added (apart from the number of hits) to the community outside STAR of the databases and interfaces built in WP7. Who is the target audience for these products? How do they position themselves as the "go to" database on the internet?

Future meetings

The EAB appreciates the timely availability of documents for the meeting and the recommendations on where to focus! The EAB can be most effective if our future meeting documents are also provided well in advance of the meeting with indications on where to focus, together with project expectations to the EAB.

The EAB looks forward to receiving the experimental plans for WP4 and 5 in the November timeframe, the mission statements and the revised performance indicators. We also look forward to being notified of the availability of future reports and reviews and to helping make STAR a success!

5.2 STAR's Response to the EAB Report

STAR is pleased with the professionalism and enthusiasm that the EAB members have for the NoE. Many useful ideas were put forward that will improve the probability of STAR's success. STAR is currently evaluating the EAB report and fully considering its recommendations. STAR will continue to provide feedback to the EAB on a regular basis. A formal response to their first report is planned for November 2011, when STAR will provide the EAB will additional information on our experimental research plans. A copy of the response will be included within STAR's next performance report to the EC.

6. Appendices

6.1 Manuscripts by STAR members related to the Fukushima accident

Jacqueline Garnier-Laplace, Karine Beaugelin-Seiller and Thomas G. Hinton (2011). Fukushima Wildlife Dose Reconstruction Signals Ecological Consequences. *Environmental Science & Technology*. doi.org/10.1021/es201637c

See also comments on this article in Nature News and Chemical & Engineering News.

Nicholas A. Beresford and David Copplestone (2011). Effects of ionizing radiation on wildlife - what knowledge have we gained between the Chernobyl and Fukushima accidents? *Integrated Environmental assessment and Management*. DOI:10.1002/ieam.238

Nicholas A. Beresford and Brenda J. Howard (2011) An overview of the transfer of radionuclides to farm animals and potential countermeasures of relevance to Fukushima releases. *Integrated Environmental assessment and Management*. DOI:10.1002/ieam.235

Hildegarde Vandenhove and Catrinel Turcanu (2011). Agricultural land management options following large-scale environmental contamination. *Integrated Environmental assessment and Management*. DOI:10.1002/ieam.234

Brit Salbu (2011). Radionuclides released to the environment following nuclear events *Integrated Environmental assessment and Management*. DOI:10.1002/ieam.232

Jordi Vives i Batlle (2011). Impact of nuclear accidents on marine biota *Integrated Environmental assessment and Management*. DOI:10.1002/ieam.231

Deborah H. Oughton (2011). Social and ethical issues in environmental risk management *Integrated Environmental assessment and Management*. DOI:10.1002/ieam.226

Hildegarde Vandenhove and Lieve Sweeck (2011). Soil vulnerability for cesium transfer *Integrated Environmental assessment and Management*. DOI:10.1002/ieam.237

6.2 STAR's first Newsletter

Volume 1, Issue 1

June 2011

STAR GAZING

The Radioecology Exchange

STAR casts its first LIGHT

Congratulations! We are up and running —gaining momentum each week!!

Europe's first Network of Excellence in Radioecology has started casting its light.

Much has happened in the short 5 months since our kick-off meeting in February (photo at right).

We even have a new, professionally designed logo that more closely meshes with that of the ALLIANCE logo (thanks to Per Strand and NRPA for their contributions; see page 4).

Good News! Our Consortium Agreement is complete and is now being circulated for final signatures among the STAR Partners.

Thanks to Nick Beresford, Cath Barnett and Brenda Howard, **we are on the web!** Our Wiki Site (www.star-radioecology.org) has separate sections for the public, STAR members, and STAR's External Advisory Board.

We are excited that STAR and the ALLIANCE will have two 1.5-hour time slots at the International Conference on Radioecology and Environmental Radioactivity.

GREAT work TEAM!!

STAR

STRATEGY FOR ALLIED RADIOECOLOGY

STAR Partners

IRSN · STUK · Ciemat · Bundesamt für Strahlenschutz · NATURAL ENVIRONMENT RESEARCH COUNCIL · SCK·CEN · Stockholms universitet · Statens strålevern · Norwegian Radiation Protection Authority · SEVENTH FRAMEWORK PROGRAMME

STAR Galaxy

Inside this issue:

Appendix 6.2: (continued)

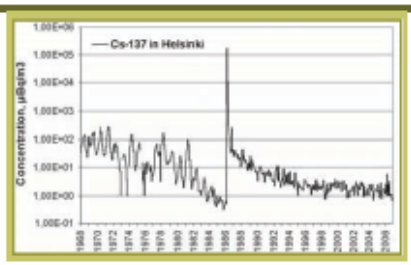
STUK–53 Years of Radioecological Research

Focus on a STAR PARTNER

The Radiation and Nuclear Safety Authority (STUK) was started in Finland during the **spring of 1958**, with concerns of fallout from nuclear weapons testing. Fallout was particularly important in the northern regions of Finland, due to high concentrations of radionuclides in lichen and their subsequent consumption by reindeer.

Some of the early Nordic research became classic radioecological studies that alerted the world to the transfer of contaminants throughout ecosystems.

Whereas weapons fallout had impacts to Northern Finland, the Chernobyl accident affected central and southern Finland. STUK research has shown that the decrease in Chernobyl radioactivity occurs



slowly in many forest and freshwater habitats of Finland. Many lakes have fish that still exceed the 600 Bq/kg guidance for food products recommended by the European Commission.

STUK's marine research has helped document Chernobyl's remarkable persistence in the Baltic Sea. Activity concentrations are still 4 times higher in seawater and 100 times higher in sediments than before the accident.

STUK's **Tarja Ikaheimonen** leads Work Package 2 on the difficult task of developing a sustainable integration among STAR's partners, a task that will be facilitated by our development of a common Strategic Research Agenda .

The nuclear world watches STUK as Finland produces one of the first new generation reactors at Olkiluoto, adding to the 4 reactors that produce about 30 percent of the country's electricity.

STAR is strengthened by the diverse expertise and positive, cooperative attitude that STUK brings to the consortium.

Tarja Ikaheimonen (left, front) hosting a special evening in Helsinki

Working Behind the Scenes

FOCUS On PEOPLE…

Our recent meetings were successful because of the hard work and dedication of many people working behind the scenes….

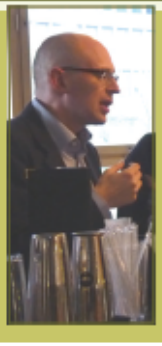
For WP-4 and WP-5 meetings on contaminant mixtures and experimental design in Belgium:

Many THANKS to Nathalie Vanhoudt, SCK-CEN !!!

FOCUS On PEOPLE…

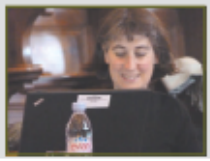
For WP-2 and WP-6 meetings in Helsinki on Integration and Stakeholder Needs for Radioecologists:

Many THANKS to Sanna Inkinen; STUK !!!



FOCUS On PEOPLE…

For Our STAR Kick-off meeting in Saint Maximin, France …..as well as the many STAR tasks she performs (including the Consortium Agreement). ……Many THANKS to Laureline, Fevrier, IRSN !!!



Work Package 6 Stakeholders Meeting in Helsinki

WHAT are the DEMANDS for Radioecology?

That was the fundamental question that Work Package 6 (led by Deb Oughton, UMB) asked of representatives from regulatory bodies, international organizations, national laboratories and EU representatives at a STAKEHOLDER workshop, held in May (**hosted by STUK**).

It was encouraging to hear the resounding need for radioecology expressed by the stakeholders at the meeting.

33 participants were involved and 9 discussion reports were generated.

THANKS to Deb, Brit, Lindis and Ole Christian (UMB); Almudena and Juan Carlos (CIEMAT) for an excellent workshop.

Steve Minok (CNSC) and Malgorzata Sneve (NRPA) engage in some stimulating STAKEHOLDER conversations in Helsinki!!

Appendix 6.2: (continued)

STAR's Mission Statement

RADIOECOLOGY: ***Integrating Science to Advance Radiation Safety and Environmental Health Protection***

Our mission statement begins with a key word that is central to STAR and the ALLIANCE, as well as encompasses the historical aspects from which radioecology emerged as a science. *Integrating*, the first word of the mission statement, defines how radioecology emerged during the 1950s from a collection of other established sciences: including nuclear physics, chemistry, biology, ecology, physiology, and toxicology. The new science of radioecology required an integration of these disciplines in order to understand the effects of radiation from the globally dispersed fallout of nuclear weapons tests. Integration remained key to radioecology in later years as the science addressed problems of releases from the nuclear fuel cycle and major nuclear accidents. The radioecology of 2011, however, has not stayed abreast of the advances in many of these founding disciplines. Therefore, our mission for the future is to renovate the *integrating* component of radioecology by actively seeking input and collaboration with other nuclear and environmental sciences.

Integration is also central to STAR and the ALLIANCE. STAR is, in part, an experiment in determining how to develop an integration of the radioecological research and development programs among its nine organizations. An entire work package of STAR is devoted to this important topic believed to be critical to the sustainability and long term viability of the science. STAR's lessons-learned on integration will be delivered to the ALLIANCE so that the platform can expand its goals for radioecology beyond Europe.

Our mission is a statement of forward momentum and progress expressed through the action words of *integrating* and *to advance*. Indeed, our future for radioecology encompasses goals of advancing the science more rapidly by using hypothesis-driven research, and solving radioecological problems by applying the innovative tools developed in other sciences. Examples include our mission of applying the "-omic" sciences to understand fundamental mechanisms of radiation effects; the development of predictive biomarkers; and developing state-of-the-art decision support tools.

The mission is anchored in radioecology's commitment to enhance *radiation safety* and improve *environment health*. Importantly, radioecology's applied service role to society is captured in the final word of our mission: *Protection*. It is through this mission that STAR's future is developed.

STAR
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STAR participants set sail from Helsinki, following a successful meeting of WP-2 and WP-6.

Focus on the Future

Change Management Challenges...

Nine organizations and eight countries, with diverse cultures and native languages of : Norwegian, Finnish, Swedish, Dutch, German, Spanish, French, English and American...

To be successful as a TEAM we must remember:

- that different is not wrong
- that respect is essential
- to be open to new ideas
- to focus on our goals
- to work hard at effective communication on all levels

Maarit Muikku (STUK) and Per Strand (NRPA) at STAR's kick-off

Appendix 6.2: (continued)

STAR's Amazing Opportunity

IT'S TRUE….this is a **RARE opportunity** that seldom comes along within a scientist's career…

To INFLUENCE the course of a scientific discipline by:

- Approaching science in a new, integrated way
- Influencing the future direction of research via the Strategic Research Agenda
- Addressing complex questions that only a consortium of partners could attempt

To OFFSET the decline of a science by:

- Inspiring the interest of youth to participate in the science
- Educating stakeholders about the values of the science
- Integrating our organizations and taking advantage of our diverse cultures, approaches, locations, skills, expertise , interests

Contaminant Mixtures and Experimental Design Workshops

Workpackage 4 (Hildegarde Vandenhove, SCK-CEN) and Workpackage 5 (Jacqueline Garnier-Laplace, IRSN) held a joint workshop in Mol, Belgium.

Experts on contaminant mixtures and DEB-tox models were invited to Belgium to enlighten the STAR researchers about the latest advances in their science. Many interesting and informative lectures were given by the international guests.

Hildegarde, Mol participants and Belgium Beer :)

Both workpackages intend to share their protocols and experimental designs relative to their studies of radiation effects on plants and animals. Fruitful discussions, and some interesting debates were held on hypothesis testing and the best selection of experimental organisms!

Deb Oughton, Hans Løkke and Dave Spurgeon discuss science, while enjoying good food.

Martin Steiner (BfS) tells STAR about Observatory sites...

EUROPEAN RADIOECOLOGY ALLIANCE

PRIMARY OBJECTIVE of STAR

To develop a sustainable, efficient, long-term integration of Radioecology in Europe

by integrating a substantial part of STAR members' activities in radioecology, while pursuing research that was prioritized in our draft Strategic Research Agenda.

by establishing a framework for transitioning STAR to a more sustainable, long-term integrated structure represented by the ALLIANCE platform.

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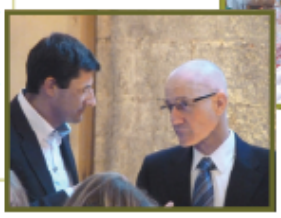
STAR is on the web !!!

www.star-radioecology.org



Andre Jouve, STAR's contact with the European Commission, and Didier Gay (IRSN) at the kick-off meeting.

Clare Bradshaw (SU), Jacqueline Garnier-Laplace (IRSN) and Rodolphe Gilbin (IRSN) at work during the kick-off meeting.

Have Suggestions for the Next Newsletter?

Contact: Tom Hinton
STAR Coordinator
IRSN
Bat 159-BP3,
13115 Saint Paul-lez-Durance, France

Phone: +33 4 42 19 95 32
E-mail: thomas.hinton@irsn.fr

Funded by the European Commission and the STAR Partner Organizations

Cheers to you, …
- tom

6.3 STAR's advertisement in the July issue of EU's "Research Review"

RADIOECOLOGY - Advancing the Science of Protecting Humans and the Environment from Radiation

Decision makers and the public need accessible, understandable information about the many different issues concerning radioactivity in the environment. Scientists need to provide independent guidance based upon well founded research. This is especially important in the aftermath of the accident at Fukushima and at a time when many countries are considering new nuclear power stations.

Radioecology is the study of the behaviour and effects of radioactive elements in the environment and measures exposure to radiation of humans and other organisms.

Radioecologists consider many sources of natural and manmade radioactivity. They also develop methods of reducing people's exposure to radioactivity such as those used after the Chernobyl accident. These skills will again be required in response to the Fukushima accident.

Radioecology became a strong discipline in Europe in response to the Chernobyl accident.
But now, as experts retire, expertise is being lost and is becoming fragmented across Europe.
The STAR consortium, funded under the EURATOM programme aims to stop this decline.

STAR a new *European Network of Excellence*

...will **INFLUENCE** the course of radioecology by:

- **APPROACHING** our science in a new, integrated way
- **ADDRESSING** complex research priorities that only a consortium of partners can accomplish
- **INFLUENCING** the future direction of research via a long term strategic research agenda

...will **OFFSET** the decline of radioecology by:

- **INSPIRING** the interest of youth to participate in our science
- **EDUCATING** stakeholders about the value of our science
- **INTEGRATING** nine organisations from eight countries, taking advantage of our diverse cultures, approaches, locations, expertise, and interests

Visit our websites
www.star-radioecology.org
www.european-radioecology.org

STAR Coordinator:
Tom Hinton (IRSN, France)
thomas.hinton@irsn.fr

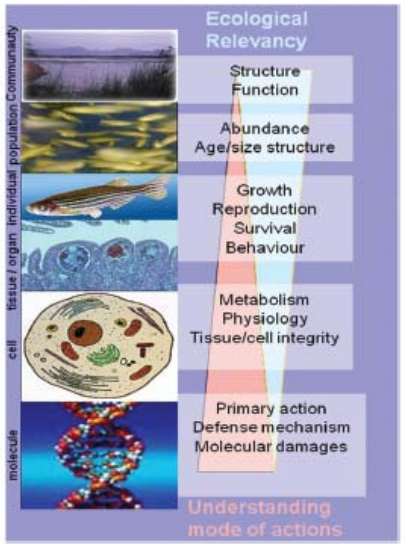
EUROPEAN RADIOECOLOGY ALLIANCE

6.4 STAR's communication pamphlet

Research

STAR's research programme will address three key radioecological questions:

- What is required for the integration of human and non-human protection and how might it be approached?
- Are radiation protection criteria protective enough when considering a mixed contamination event?
- How can we best enhance the Reference Organism approach for protecting ecosystems from radiation?



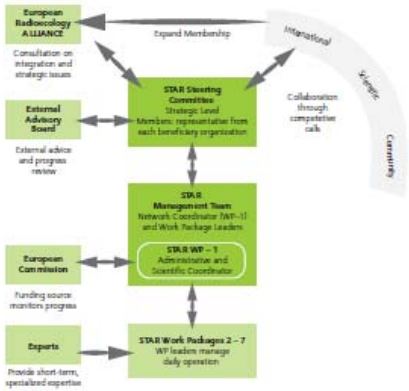
Dissemination

Knowledge dissemination is a key component of STAR and we will:

- **Promote** open access to data using cataloguing and searchable databases
- **Develop** online training and education materials
- **Provide** easy access to a variety of different radioecological outputs
- **Investigate** the use of social networking to provide information to a wide audience

Collaborating with STAR

Effective collaboration with other scientists will be actively sought. We will hold workshops to obtain input from diverse stakeholders; request expert assistance in specific scientific disciplines associated with our research; collaborate with laboratories conducting similar research.



STAR
STRATEGY FOR ALLIED RADIOECOLOGY

INTEGRATION OF EUROPEAN RADIOECOLOGY PROGRAMMES

SHARING INFRASTRUCTURES, COLLABORATING IN RESEARCH, DEVELOPING EDUCATIONAL PROGRAMMES AND COLLECTIVELY MANAGING AND DISSEMINATING KNOWLEDGE

Co-ordinator
Tom Hinton (IRSN, France)
thomas.hinton@irsn.fr

www.star-radioecology.org

EURATOM
EUROPEAN RADIOECOLOGY ALLIANCE

Appendix 6.4 (continued)

Rationale

The need for radioecological expertise is increasing in nuclear energy and the associated environmental challenges related to the nuclear fuel cycle. Concurrently, educational opportunities in, and funding for radioecology have steadily declined with leading experts retiring. The Fukushima accident presents us with additional challenges.

STAR, a European Commission Network of Excellence in Radioecology (funded under the EURATOM programme), has been created to confront these challenges.

STAR's goal is to integrate the radioecology programmes of key European organisations by sharing infrastructures, collaborating in research, developing joint educational programmes and collectively managing and disseminating associated knowledge.

STAR also has a collaborative research programme focussed on key questions for human and environmental risk assessment.

Education & training

To help meet the need for both worker training and student education we will;

- **Engage** with stakeholders to determine radioecological training and education needs
- **Test and implement** a selection of training and education modules
- **Secure** funding mechanisms for a sustainable radioecological training and education platform.

The STAR Consortium

IRSN INSTITUT DE RADIOPROTECTION ET DE SÛRETÉ NUCLÉAIRE — French Institute for Radiological Protection and Nuclear Safety

STUK — Radiation and Nuclear Safety Authority, Finland

SCK•CEN — Belgian Nuclear Research Center

Centre for Ecology & Hydrology — Natural Environment Research Council - Centre for Ecology & Hydrology, UK

Ciemat Centro de Investigaciones Energéticas, Medioambientales y Tecnológicas — Research Centre in Energy, Environment and Technology, Spain

Stockholm University — Stockholm University, Sweden

Bundesamt für Strahlenschutz — Bundesamt für Strahlenschutz, Germany

Statens strålevern — Norwegian Radiation Protection Authority

Norwegian University of Life Sciences

Integration

The overarching aim for STAR is to integrate the infrastructures and research efforts of European organisations into a sustainable network that contributes to a European Research Area in radioecology.

One goal in reaching this is to develop a Strategic Research Agenda (SRA) to provide a long-term vision of Radioecological research needs within Europe. The content of this will be developed through consultation with the wider ecological community, regulators, international organisations, industry and other stakeholders.

At the end of the STAR project it is envisaged that the SRA and integrated research programme will continue to be managed in a integrated manner under the auspices of the European Radioecology Alliance.

Radioecology Alliance

The European Radioecology ALLIANCE was formed in June 2009, with the signing of an MoU by the heads of 8 European organizations involved in radioecological research: BfS (Germany), NERC (United Kingdom), CIEMAT (Spain), IRSN (France), NRPA (Norway), SCK/CEN (Belgium), SSM (Sweden) and STUK (Finland).

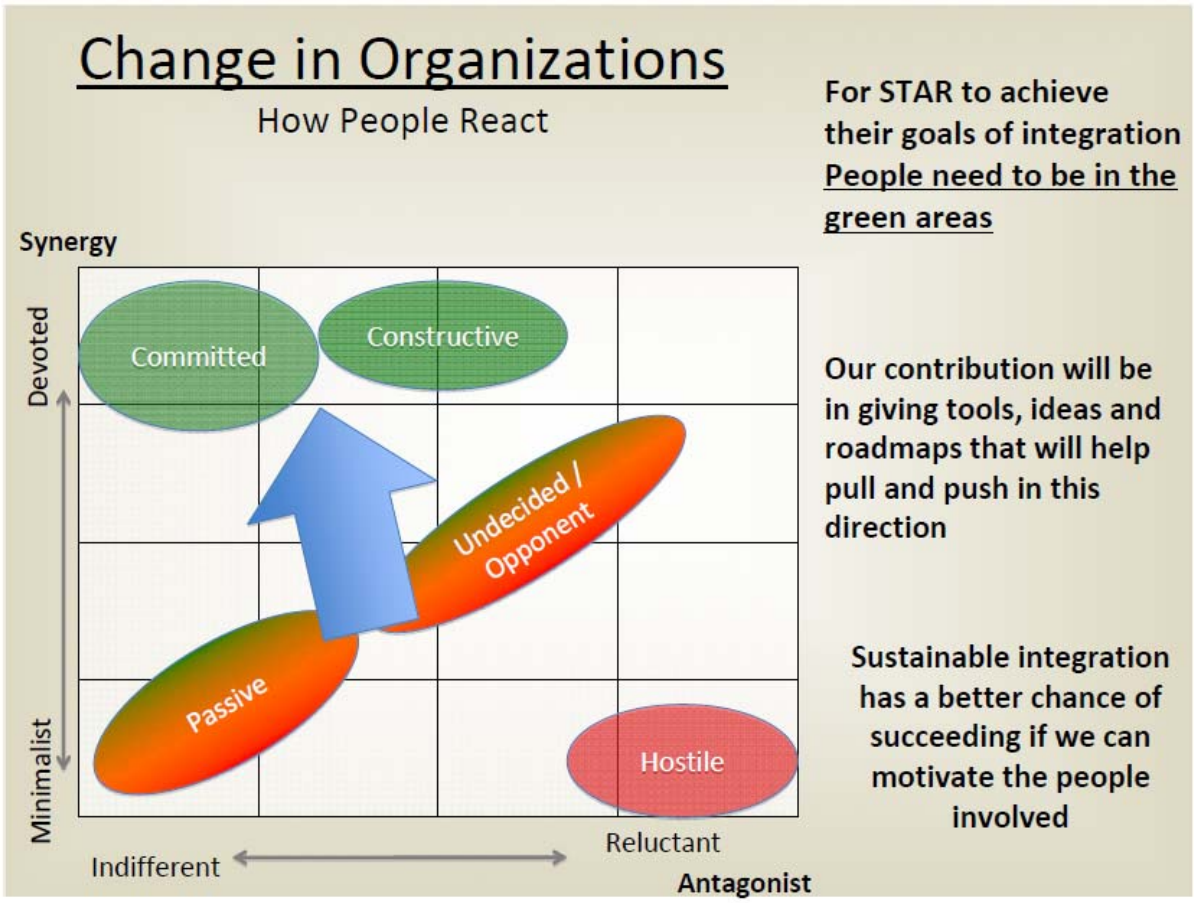
The MoU states that these organizations will bring together portions of their respective R&D programmes in radioecology into an integrated, transnational coalition. The ALLIANCE goals are to maintain European radioecological competences and infrastructures, while addressing the scientific and educational challenges of assessing the impacts of radiation on humans and the environment. The ALLIANCE intends to expand its membership worldwide under the scope of the Strategic Research Agenda being developed by STAR.

www.european-radioecology.org

6.5 MBA students' presentation to STAR's External Advisory Board

Appendix 6.5 (continued)

Appendix 6.5 (continued)



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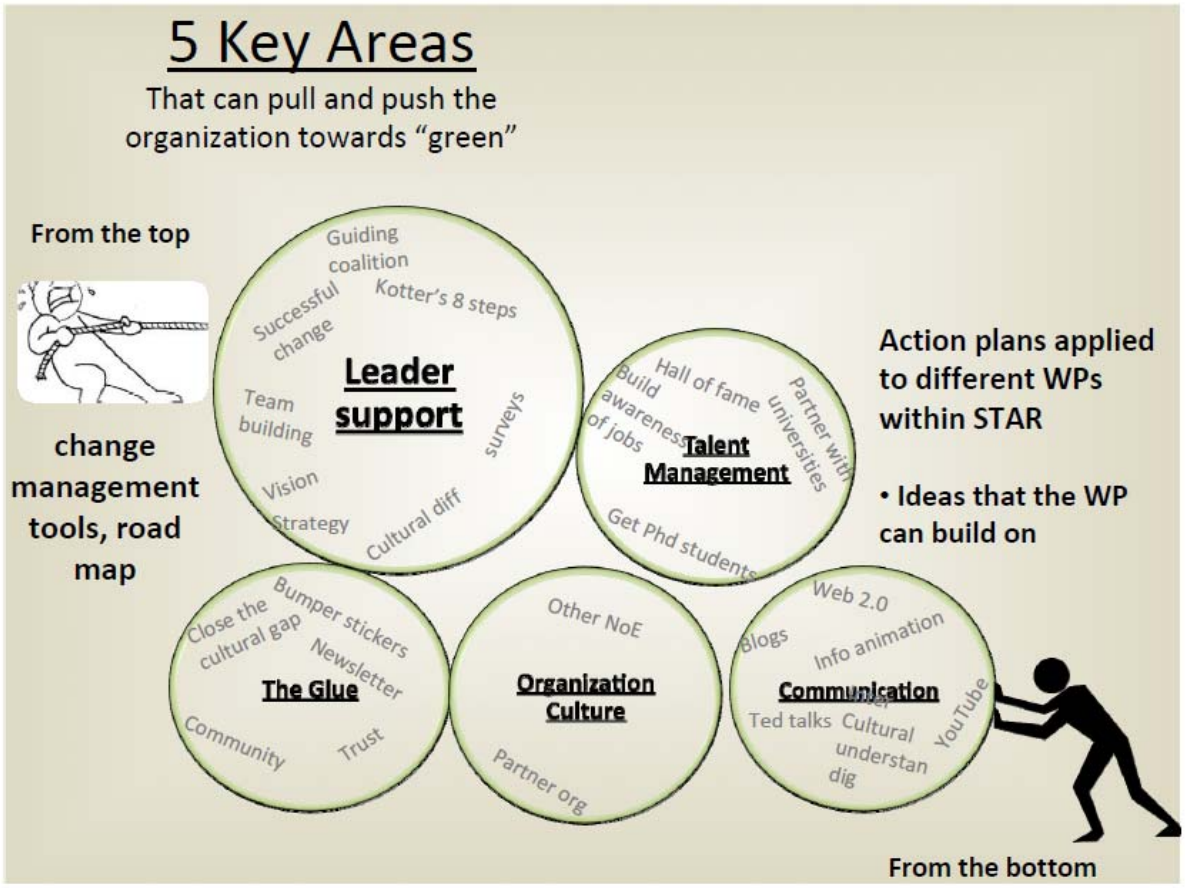

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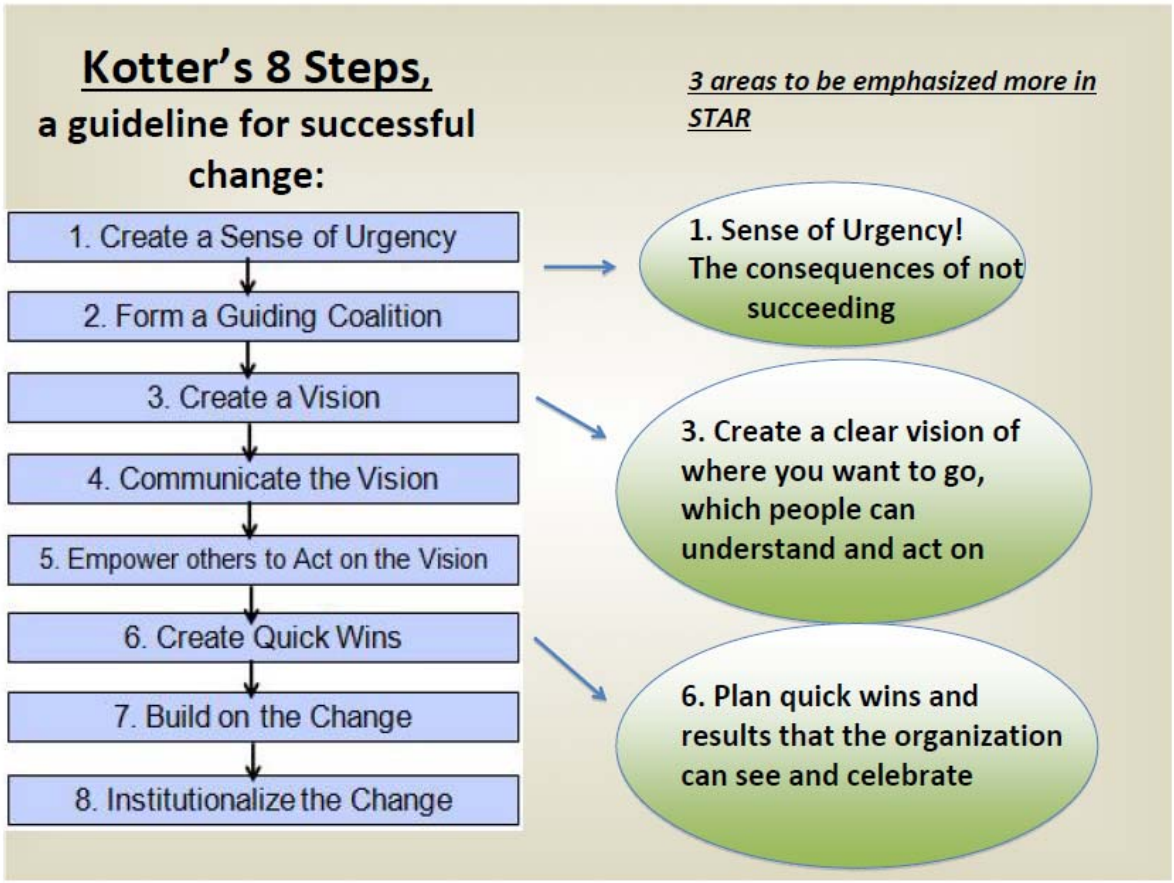
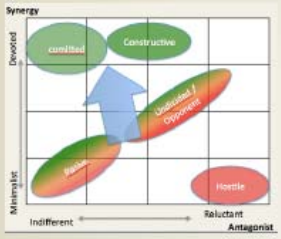


Appendix 6.5 (continued)

Our Deliverables



Leader support sessions with Tom

- STAR from a change perspective and how to best lead and coordinate that process

A *step by step* road map to lead change

- Best practices from change management tools and other NoEs
- Make a phase by phase time line that includes pitfalls and actions
- Integrate it with STAR agreement and work documents

Action Plans with ideas that can be implemented at the WP level