Meeting of Program Area Committee 2
Operational Radiation Safety
Sunday March 9, 2013; 8:30 AM
Embassy Room
Hyatt Regency Bethesda
Bethesda, Maryland

AGENDA

8:30 AM	Welcome and opening remarks	Pryor
8:45	Remarks from the President	Boice
9:00	Status of SC 2-6, Radiation Safety Aspects of Nanotechnology	Myers/Pryor
9:15	Discussion of Issues – SC 2-7, Radiation Safety Aspects of Sealed Radioactive Sources	All
Noon	Lunch	
1:00 PM	Continue discussion of issues – SC 2-7	All
2:15	Summary of assignments	Pryor
2:30	Adjourn and move to general PAC session	All

Attendees: Ed Bailey, Carol Berger, John Frazier, Dave Myers, John Poston, Kathy Pryor, Glenn Sturchio, Josh Walkowicz, Jim Yusko. Guests: Chris Donahue, Mark Hoover. Absent: Eric Goldin.

The committee discussed potential replacements and additions to the membership of PAC-2. A number of names were suggested. The committee membership is well balanced at this point, so there are no specific skill sets that we are seeking. Willingness to actively participate in report writing is very important. John Frazier agreed to follow up with his suggested nominee to see if he was interested in joining the committee.

Dave Myers and Mark Hoover provided an overview of the status of SC 2-6, Radiation Safety Aspects of Nanotechnology. In July 2013, the decision was made to write a report instead of a commentary. Dave handed out a copy of the table of contents and discussed progress on the report. The committee has had a number of meetings and teleconferences since January 2013. The committee suggested that any special considerations regarding recordkeeping be addressed in the report. The plan is to discuss the differences that might be needed in radiation safety programs when working with radioactive nanomaterials, and to point to other references for the basic components of the program that are not affected.

John Boice addressed the committee, and solicited feedback and suggestions. He reminded the committee that we should prepare "one-pagers" for any future projects that we envision is needed in our area.

The committee discussed issues that required resolution before proceeding with the draft for SC 2-7, Radiation Safety of Sealed Radioactive Sources.

- Categorization schemes – The IAEA source categorization scheme of categories 1 through 5 was recommended. IAEA has exempt sources and sources that would be subject to regulatory control. There is no specific provision for generally licensed sources, as exists in the NRC's regulatory structure. (there is a provision for regulatory authorities to adopt modifications of the source categorization scheme.) It was agreed that our recommendation will follow the IAEA and will not include a provision for generally licensed sources. We will only include exempt sources and sources that should be subject to regulatory control, and we agreed to use the IAEA exemption level with its 1 mrem TEDE dose basis.
- Generally licensed sources/devices – A number of the committee members discussed previous incidents and problems with generally licensed devices.
- The IAEA source categorization scheme does not list all isotopes of interest. It was agreed that we would recommend that manufacturers of sealed sources/devices using isotopes that are not on the list would do a hazards analysis to demonstrate that they can meet the 10 uSv (1 mrem) dose limit.
- Discussion regarding sources and devices can be added into the introduction. The fact that sources frequently are included in devices needs to be clarified; the report will address both.
- The recommended definition of a sealed source – replace the word "device" with "item" to avoid confusion.
- Security classifications – this is outside of our scope; we will just point to existing security classification schemes and not provide additional recommendations. [NOTE: during the wrap-up of the annual meeting presentations, Ken Kase said

that in some other countries, the word "security" was used to mean "safety". We may need to clarify this, although our audience is the US and not necessarily an international audience.]

- PAC-4 members asked if we were going to address radioactive microspheres and brachytherapy seeds as sealed sources in the medical section of the report. This will need to be discussed in a future meeting and/or draft; there are requirements to inventory them, but not to leak test them.
- The committee discussed the issue of putting the information on fragile sources into a separate section or embedding the discussion in the applicable sections throughout the report. There was no clear consensus on this; it is important to have pointers to a separate section if we use one. [NOTE: I think we will try to combine discussion into the existing sections, rather than have a separate section at this point. We can revisit this on the next draft.]
- The committee discussed leak test limits. The limits are currently based on what the instruments were capable of detecting in the field. Anything detectable should trigger corrective action, even if it was below the 0.005 uCi NRC limit. The consensus was that the current draft addressed the issue of "anything detectable" adequately. Smears for leak testing should be frisked with a survey instrument before mailing them off if you are using a vendor for leak test services. In addition, leak test analysis should be performed with instruments that can achieve an MDA that is less than 10% of whatever reporting limit is being used
- The committee agreed that we should add a short section on emergency response. It can refer to other NCRP reports.
- It was suggested that we add a checklist for sealed source users on their responsibilities.

Other Items – The committee agreed that Kathy would send the updated draft out for the committee's use by March 31, 2014. The next set of input is due back to Kathy by May 31, 2014.

Next Meeting: Baltimore, MD on Saturday, July 12th in connection with the HPS meeting. We will plan an all-day meeting to go over the next draft of the SC 2-7 report.

Action Items:

- Kathy Pryor - will incorporate input received to date, plus any changes that we made during the meeting into the most current draft, and will send it to the group by March 31st.
- Carol Berger – will modify section 2 (as a new chapter) to incorporate the recommendation to use the IAEA categorization scheme, with sources either

exempt or subject to regulatory control, based on an allowable dose of 10 uSv. [**Due 5/31/14**]

- Josh Walkowicz – will add information on lessons learned from problems and incidents with generally licensed devices into the lessons learned section. **[Due 5/31/14]**
- Josh Walkowicz – will develop a checklist for sealed source users. [**complete**]
- Josh Walkowicz /Carol Berger – add a short section on Emergency Response to the draft. **[Due 5/31/14]**
- John Frazier – will draft the sections on industrial uses and sterilization facilities. **[Due 5/31/14]**

Attachments:
Slides from John Boice's presentation.

PAC 2
PAC Meeting Goals - General
March 10, 2014

- Encourage Yearly Meeting/s
- Tap into Expertise in Council (Meet & Greet)
- Generate Ideas for Proposals/Funding
- Integration of PACs (Show & Tell)
- Did it work? Valuable? Continue?

2014 Annual Meeting:
March 10-11, 2014
NCRP – Achievements of the First 50 Years and Opportunities for the Future

All PACs Involved in this 50 Year Celebration

- **PAC 1 - Epidemiology & Biology**
- **PAC 2 - Operational Radiation Safety**
- **PAC 3 - Security & Safety**
- **PAC 4 - Medicine**
- **PAC 5 - Environment & Waste**
- **PAC 6 - Dosimetry & Measurements**
- **PAC 7 - Risk Communication & Outreach**

NCRP COMMENTARY No.

RADIATION SAFETY ASPECTS OF NANOTECHNOLOGY

Coming Soon

NCRP National Council on Radiation Protection & Measurements

Mark Hoover
Chairman SC 2-6
Senior Research Scientist,
NIOSH

PAC 2 and PAC 6 Collaboration

M.D. Hoover, *Chair*
D.S. Myers, *Vice Chair*
R.A. Guilmette
L.J. Cash
W.G. Kreyling
G. Oberdoerster
R. Smith
M.P. Grissom, *Staff Consultant*

13th International Congress of the International Radiation Protection Association, Glasgow, Scotland

Dose Assessment Due to Inhalation of Plutonium Nanoparticles

Leigh Cash, Guthrie Miller, and Luiz Bertelli

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INTRODUCTION

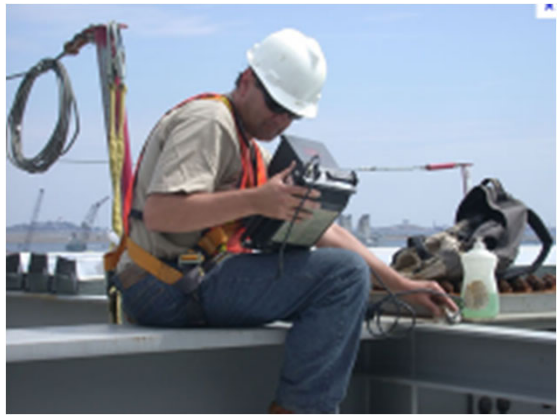
Experience has shown that nanoparticles behave differently in terms of deposition and clearance from the respiratory tract as compared to micron-sized particles. However, currently used HRTM models have not addressed the very particular aspects of inhalation, deposition and further distribution of radioactive nanoparticles in the human body. Plutonium is one of the most important radionuclides in the nuclear industry and production of it in nanoparticle form is not negligible. Therefore, this study was done to investigate deposition to the respiratory tract, clearance, and subsequent distribution to systemic organs based on animal data and human studies.

SC 2-7: Radiation Safety of Sealed Radioactive Sources

Purpose: To provide comprehensive guidance on the radiation safety aspects of sealed radioactive sources from "cradle to grave." Recommendations will be provided on the definition of a sealed radioactive source, including design characteristics that should be considered. Guidance will be provided in the safe handling, tracking and control of sealed sources. The report will also present a set of "lessons learned" regarding what has gone wrong with sealed sources, what caused those events, and what could be done to prevent them in the future. Example procedures for confirming inventories, leak testing, labeling, safety, training, periodic inspection, and emergency response may also be provided.

In House, Opportunistic, High Quality, Low Cost

K.H. Pryor, Chair
E.D. Bailey
C.D. Berger
M.L. Birch
J.R. Frazier
E.M. Goldin
D.S. Myers
J.W. Poston, Sr.
G.M. Sturchio
J. Walkowicz
J. Yusko
J. Thompson, Consultant



PAC 2
March 10, 2014

- Great Model – In house Reports – Practical
- What's Next?
- Generate Ideas for Proposals/Funding
- Opportunistic meetings, Opportunistic funding
- For example, NYC and Emergency Response Dosimetry