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INTERNATIONAL ACCELERATOR RADIOLOGICAL PROTECTION (IARPE)  
NEWSLETTER

JANUARY 1992

FROM THE EDITOR'S TERMINAL

(Nisy Ipe IPE@SLACVM)

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As the United States remembers the life and work of Martin Luther King Jr., I am strongly reminded of his words "I have a dream....." It is always those dreams and visions that spur us on to lofty endeavours. Thanks to the fine efforts of our correspondents a dream has been realized. I am pleased to present the very first edition of the IARPE Newsletter. The vision still remains. We would like to see more participation from all the facilities (in the form of contributions to the newsletter). Our goal is to produce a high-quality newsletter, once a month. This will largely depend on the involvement and cooperation of all of you in the accelerator community.

The distribution list for the newsletter is being managed by LISTSERV. All of you who receive this newsletter are already on the distribution list. Anyone else who wishes to subscribe may do so by using the following command:

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TELL LISTSERV ADD IARPE-L <E-MAIL ADDRESS> <Real Name>
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For example, I could subscribe by using the following command:

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TELL LISTSERV ADD IARPE-L IPE@SLACVM Nisy Ipe
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Suggestions and ideas on improving the quality of the newsletter are always welcome.

NEWS FROM BNL

(Carl Schopfer Schopfer@BNLCL1)

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A three-year engineering study, of major components in the 'Phoenix' project, has been proposed to DOE by Gregory Van Tuyle, Hiroshi Takahashi, and Michael Todosow of Brookhaven National Laboratory (BNL). The 'Phoenix' concept is based on an idea originally proposed by Takahashi in the 1970's. The idea is to utilize a hybrid linear

proton accelerator driving a sub-critical target to reduce nuclear waste as part of the Clean Use of Reactor Energy (CURE) plan proposed by Westinghouse Hanford Corporation. The BNL team will study how to scale up a two-dimensional beam expander located at BNL's Radiation Effects Facility and use a 1.6 billion electron-volt beam from the Alternating Gradient Synchrotron Booster to study target damage.

Original article by Marsha Belford, of the Brookhaven Bulletin, V46:2, January 10, 1992

JOBLINE is a voice-message system which describes current job openings at Brookhaven National Laboratory. To access JOBLINE call 516-282-7744 from a touch-tone phone.

#### NEWS FROM CERN

(Alberto Fasso' FASSO@CERNVM)

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All CERN accelerators were stopped before the Christmas holidays. As usual, the long winter shutdown will be devoted to maintenance and installation work. Setting up of the machines is planned for the middle of March, but physics data taking will not take place before April. The main radiation protection task during this shutdown will be the supervision of complete dismantling of the neutrino cave, one of the most radioactive areas of CERN.

Presently, three foreign visitors are working within the CERN Radiation Protection Group:

A. Koczynski (Central Laboratory for Radiological Protection, Warsaw) is working on a new densitometer for gamma film reading; Ye Sizong (Environment Monitoring Centre, Shanghai) and J. Zazula (Institute of Nuclear Energy, Cracow) are making Monte Carlo calculations for the Large Hadron Collider project.

Here is a list of reports published by members of the Radiation Protection Group during 1991. Interested people can request copies from Alberto Fasso', CERN TIS-RP, CH-1211 Geneva 23 (Switzerland) (or better E-mail FASSO@CERNVM.CERN.CH).

Divisional Reports:

D.R. Perry, K.B. Shaw, G.B. Stapleton, G.R. Stevenson, R.H. Thomas, Trends in radiological and environmental protection in high-energy accelerator laboratories, CERN-TIS/RP/91-04/CF

M. Hoefert, A long-term study of personal neutron monitors in stray

fields around high-energy proton accelerators, CERN-TIS/RP/91-06/pp

A. Fasso', M. Hoefert, A. Ioannidou, On the shielding of electron accelerators in the GeV energy range, CERN-TIS/RP/91-08/CF

G. Stevenson, A. Fasso', C. Furetta, P.G. Rancoita, P. Giubellino, J.S. Russ, C. Bertrand, Measurements of low-energy neutrons in a lead calorimeter structure irradiated by 200 GeV/c hadrons, CERN-TIS/RP/91-11

M. Hoefert, Tendencies and limits of personal neutron dosimetry in the MeV energy range, CERN-TIS/RP/91-12/CF

M. Hoefert, A. Fasso', K. Goebel, G.R. Stevenson, P. Schmidt, Radiation Protection at the Large Electron Positron collider (LEP), CERN-TIS/RP/91-14

G.R. Stevenson, A. Fasso', A. Ferrari, P. Sala, Low-energy neutron fluences in idealized collider geometries, CERN-TIS/RP/91-15/CF

#### Internal Reports:

P. Schmidt, On the calibration of TL detectors for low-energy photon dosimetry in the LEP environment, CERN/TIS-RP/IR/91-04

J.C. Gaborit, A. Fasso', Bilan 1990 des controles radiologiques sur le LEP, CERN/TIS/IR/91-05 (in French)

K. Nilsson, D. Wittekind, Measurements of natural background in view of the installation of the CERN Large Hadron Collider, CERN/TIS/IR/91-11

G. Kitis, S. Charalambous, J.W.N. Tuyn, Thermoluminescence response of LiF:Mg.Ti (TLD-100) as a function of irradiation temperature for various types of radiation, CERN/TIS/IR/91-12

M. Hoefert, F. Lehmann, P. Schmidt, On the calibration of film dosimeters with fluorescence radiation on a water phantom, CERN/TIS/TM/91-13

P. Schmidt, Application of a Bonner-sphere system in CERN radiation stray fields, CERN/TIS/TM/91-14

P. Schmidt, First experiences with the application of a TEPC area monitor in CERN radiation fields, CERN/TIS/IR/91-15

P. Schmidt, Dosimetry of scattered synchrotron radiation in the LEP environment, CERN/TIS/IR/91-18

G.R. Stevenson, J. Zazula, Radiation levels in the LHC tunnel due to halo protons lost on an LHC beam scraper, CERN/TIS/IR/91-20

M. Arvidson, Radiological hazard of irradiated ISOLDE targets, CERN/TIS/IR/91-22

G.R. Stevenson, J. Zazula, Radiation doses and secondary neutron fluxes expected in the low-beta quadrupoles following the LHC interaction region, CERN/TIS/IR/91-23

A.H. Sullivan, Some estimates of radiation levels in LHC, CERN/TIS/IR/91-26

#### NEWS FROM FNAL

(Alex Elwyn ELWYN@FNAL)

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The 1990-1991 fixed target run ended on Jan 8th. The CDF and D0 detectors will start roll-in at the end of Jan for collider run to start at the end of April.

Fermilab has two job openings for work in a broad spectrum of health physics and related activities (such as radiation measurements, dosimetry development, shielding calculations and reviews, rad detector development, etc.)

a. MA or MS in Health Physics (or related area) is preferred; or BS in Health Physics and at least two years experience in HP related work (preferably at an accelerator).

b. Ph.D in experimental nuclear or high-energy physics, and two or more years of post Ph.D experience, and a willingness to learn health physics.

For more details, contact Don Cossairt (708-840-3465) or Alex Elwyn (708-840-4626).

#### NEWS FROM LAMPF

(Sarah Hoover HOOVER@LAMPF)

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From 23 September to 8 November 1991, Los Alamos served as host for an approximately 165 member U.S. Department of Energy Tiger Team. Of these 165 personnel, 19 people were assigned to conduct a technical safety appraisal of all accelerators at Los Alamos National Laboratory, including LAMPF. One of the areas of accelerator operations that seemed to generate a lot of interest at LAMPF was life safety and fire protection

codes as they are applied in beam line tunnel areas. Specific concerns included distances to exits and the possibility of the presence of oxygen depleted atmospheres. Issues of configuration control as it pertains to shielding also seemed to be of interest to the "Tigers".

In December 1991, a workshop was sponsored at LAMPF on the Use of Instrumentation and Probabilistic Safety Criteria for Prompt Radiation Protection. Approximately 14 expert consultants from various accelerator facilities in the U.S. and Europe spent 2 1/2 days discussing these issues and how they could be applied at LAMPF.

LAMPF is presently in its annual maintenance shutdown. Full research operations are anticipated to begin this June.

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**NEWS FROM LBL****(Tony Greenhouse TONYG@CSA2.LBL.GOV)**

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We are arranging a series of roughly mono-energetic neutron irradiations at the 88-Inch Cyclotron for dosimetry research. The first of these will probably occur during the week of 3 Feb., 1992. Our plan is to conduct several experiments at neutron energies of about 20, 30, 40, and 50 MeV, followed by a broad spectrum irradiation with an endpoint energy of 50 MeV. There will be neutron spectrometry performed to characterize the fields, and the total equivalent doses will be 2, 5, and 7 mSv for each irradiation. Anyone interested in exposing their dosimeters should reach Tony Greenhouse at [Tonyg@csa2.lbl.gov](mailto:Tonyg@csa2.lbl.gov) or write to him at Bldg. 75, L.B.L. Berkeley, CA 94720.

Rai-ko Sun at L.B.L. has received a special grant from the Director's Office to develop empirical tests for an Italian Monte Carlo code which predicts higher than normal response for a modified Andersen-Braun detector. The original design responds roughly to the equivalent dose to energies from thermal to about 8 or 10 MeV, whereas the modified version is reputed to respond up to about 400 MeV.

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**NEWS FROM PLS/KOREA****(Heeseock Lee PLS@VISION.POSTECH.AC.KR)**

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The Pohang Light Source (PLS) consisting of a 2 GeV electron linac and a storage ring is located at the Pohang Accelerator Lab in Korea. The linac includes a 61 MeV pre-injector which is comprised of two accelerating sections. The linac is 150 m long and the storage ring is 280 m in circumference. The operating parameters of the pre-injector are as follows:

Electron gun current	2.1 A
Beam pulse width	2.0 nsec
Repetition rate	15 Hz

The linac housing construction is almost complete. The early commissioning of the pre-injector ( manufactured and installed with the help of IHEP, China) was accomplished successfully on Dec 7, 1991. The continuous commissioning will restart during this month.

## NEWS FROM SLAC

(Nisy Ipe IPE@SLACVM)

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We are pleased to welcome Ken Kase, who is joining SLAC as the Radiation Safety Officer, and Head of the Radiation Physics Department. Ken comes to SLAC after a distinguished career as Professor of Radiation Oncology and Director of Physics at the University of Massachusetts Medical Center. Apart from being the recipient of prestigious awards and honors, Ken has served on the Editorial Boards of the Health Physics and Medical Physics Journals, the HPS Board of Directors, and numerous committees. In addition, he has co-authored four books. Needless to say, the list goes on and on.

And now for other news.....

The SLC beams have been restored to the high-current, low-emittance conditions that existed during the last run. SLD has been closed and is ready for its first physics run. The run is scheduled through the end of July 1991. The polarized beam is also scheduled for this run.

The newly designed Final Focus Test Beam (FFTB) facility will test new concepts in optics and hardware for advanced accelerators, especially the next generation of linear colliders. Construction of the facility is almost complete. The components are currently being installed. The facility will be ready for use by December 1992. The design goal is for a 50 GeV SLC type beam that is focussed to a spot size of 0.06 micron x 1 micron. The project is a collaboration among many laboratories from France, Germany, Japan, the former Soviet Union and the United States.

The SSRL injector for the storage ring SPEAR has been commissioned, and is in the final stage of the D.O.E. Accelerator Operational Readiness Review. Synchrotron radiation will be available to the users after the completion of the review process. The electron beam energy (for the injector) is 2.5 GeV and the intensity is  $2 \times 10^9$  e/pulse at 10 pulses/sec.

## NEWS FROM TRIUMF

(Lutz Moritz SAFETY@TRIUMFRG)

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The Canadian government announced last fall that it supported the construction of the KAON Project at the TRIUMF facility in Vancouver. The cost of the project estimated at approximately \$CDN 750,000 is to be shared equally by the federal government of Canada, the province of British Columbia, and a number of foreign collaborators including the USA, Japan, Germany and South Korea. Negotiations are now proceeding to turn all the pledges into real commitments.

KAON is an acronym for Kaons, Anti-protons, Other hadrons and Neutrinos. The facility is conceived as an 'after-burner' for the present meson-factory at TRIUMF. A beam of 450 MeV protons from the existing cyclotron will be accelerated in two stages to 3 and then 30 GeV by a system of accumulator rings and synchrotrons. The ultimate goal is to generate a 100 microampere beam of 30 GeV protons. This beam will then be used to create intense beams of kaons and other exotic particles.

This facility will pose a number of challenges in radiation protection. The first is the inadequacy of various shielding calculations for the the great thickness of lateral shielding required for the nominal beam losses (approximately 8 metres of concrete and soil). Secondly there will be rather severe problems with induced radioactivity in the target regions as well as in the air of the accelerator and beamline tunnels.

In other news we have had some interest expressed in the use of the TRIUMF neutron beams for the purpose of evaluating the high energy response of neutron monitors and dosimeters. The neutron beams are generated by protons impinging on a liquid deuterium target. Because the proton energy can be continuously varied from 180 to 520 MeV the neutrons generated have a similar energy range. The neutron facility is heavily booked for 'real' physics experiments but if sufficient interest is expressed it may be possible to get some dedicated time to characterize the neutron beams sufficiently to make them useful as a reference source in this energy range. Is anyone interested?

## ANNOUNCEMENT

(Wade Patterson WADE@ISG.LLNL.GOV)

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If you could use your time and talent to maintain, and possibly improve, the already high quality of our Society publications, there's a chance for you to do that on the HPS Publications Committee. This committee meets at least once a year (during the annual HPS meeting) and possibly more frequently. The principal responsibility of the committee is to participate in the recruitment of editors for the Newsletter and the

Journal, but there are other interesting assignments as well. Two openings exist right now, and you can find out more by calling John Hageman, the Chair, at 512 522-5152.

#### Closing Thoughts

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" The world is moved not only by the mighty shoves of the heroes, but also by the aggregate of the tiny pushes of each honest worker."

Helen Keller