http://wao10.komac.re.kr

The 7th International Workshop on Accelerator Operations

April 12 - 16, 2010,
Daejeon, Korea

Abstracts Brochure

MEST POSTECH PAL KAERI PEFP

WAO10

The 7th International Workshop on Accelerator Operations

Daejeon, 12 to 16 April 2010

Hosted by

Pohang University of Science and Technology

Pohang Accelerator Laboratory

Korea Atomic Energy Research Institute

Proton Engineering Frontier Project

Program Committee

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Bum-Sik Park, PEFP

Eung-Soo Park, PAL

Jae-Won Park, PEFP

Sung-Ju Park, PAL

INTRODUCTION

On behalf of the WAO 2010 International Program Committee (IPC), we are pleased to announce the 7th International Workshop on Accelerator Operation, WAO10, to be held at Daejeon, Korea from 12 to 16 April 2010.

In accelerator operations where experiences play critical role, the exchange of knowledge and ideas about the common problems all the operation professionals face is essential to make their operations efficient and effective without wrestling with a problem for which other control rooms already have the solution.

Since the first workshop in May 1996 hosted by Jefferson Lab. in Virginia, WAO, a biennial event alternating between America, Europe and Asia, has provided the unique and natural forum for the exchange of the latest advances in the field of Accelerator Operations. We are sure that the participants of the workshop will realize that they are not alone in dealing with problems of the day-to-day accelerator operations, establish working relationships, make a real community, learn about the successes and failures in other control rooms, see how the new technologies are being applied, enjoy the benefit and insight of shared experiences, and finally walk away with new ideas that will shape the Accelerator Operation's future.

The topcis covered in the workshop include the followings.

- How We Do Business
- Commissioning
- Automation
- Tools

- Ergonomics&Control Room
- Training
- Maintenance
- Safety&Regulation
- Reliability

For detailed information on the workshop, please consult the workshop website http://wao10.komac.re.kr/.

We're looking forward to welcoming you in Daejeon.

Sincerely yours,

Kyung-Ryul Kim
Yong-Sub Cho
WAO10 Co-Chairpersons

ARRIVAL and DEPARTURE

Direction to KAERI

KAERI is located in Daejeon(=Taejon), 160km (approx. 100miles) south of Seoul.

From from Incheon International Airport to KAERI or Hotel Riviera in Deajeon

Direction: Take Airport Shuttle Bus from Incheon International Airport to Daejeon. You may take off 2nd or 3rd stop depending on your accommodation. Then take a taxi to your accommodation.

Shuttle Bus stops :

▶1st stop as soon as the bus exit from freeway (walking distance to KAERI)

▶2nd stop at "Daedok Convention Center"

▶3rd stop at "Government Complex" (nearest to Hotel RIVIERA)

▶last stop at Dong(East) Daejeon Bus Terminal

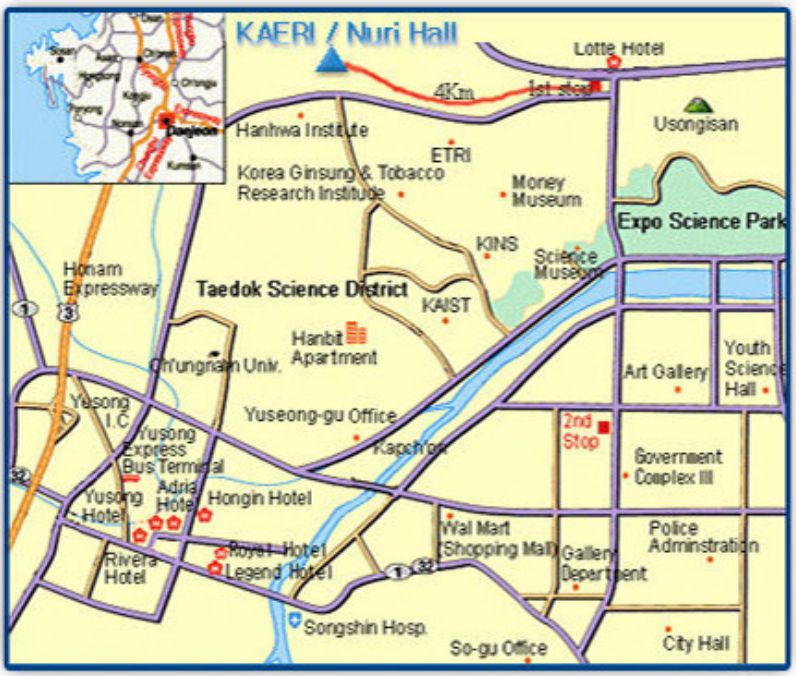
Bus ticket: Direct to Airport Shuttle Bus Stop 9D and purchase the ticket at ticket office (first come first service base)

▶Fare: 14,500 Won(Coach), 21,800 Won(Deluxe)

▶Airport Shuttle Bus Stop 9D at Incheon Int'l Airport to Daejeon

▶Airport Shuttle Bus Ticket Office

▶ North Daejeon Ramp (Exit)



▶Airport Shuttle Bus Stops in Daejeon

Taxi from Bus Stops to your accommodation:

▶ Daedok Convention Center to KAERI : approx. 5 minutes (4km), 3,000 Won

▶ Government Complex to Hotel RIVIERA : approx. 10 minutes (5km), 4,000 Won

From KAERI or Hotel Riviera to Incheon International Airport in Deajeon.

Direction: Take a taxi from KAERI or Hotel RIVIERA to Airport Shuttle Bus Stops, Daedok Convention Center or Government Complex III. Then take the Airport Shuttle Bus to Incheon International Airport.

Dong(East) Daejeon Bus Terminal

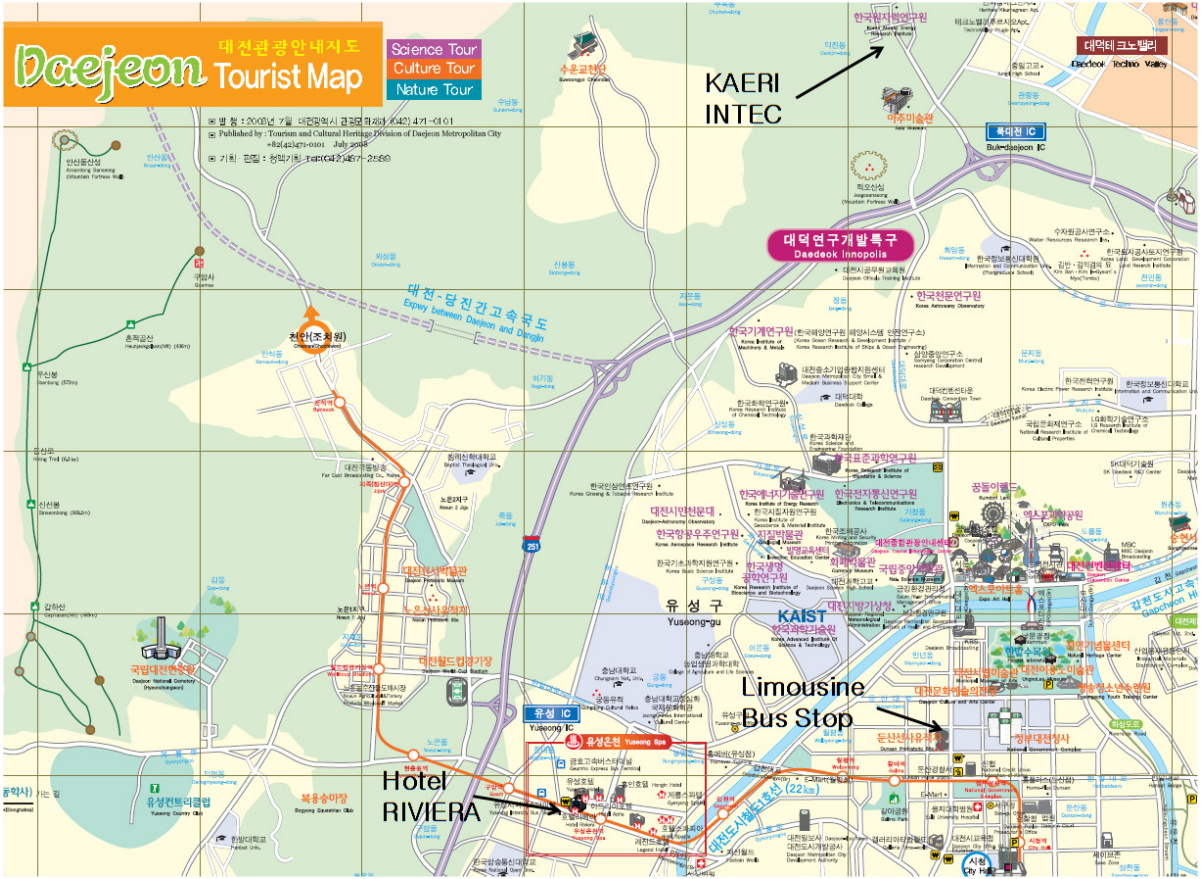
▶Government Complex III(Nearest to Hotel RIVIERA)

▶Daedok Convention Center(Nearest to KAERI)

▶Incheon International Airport

- Bus Fare

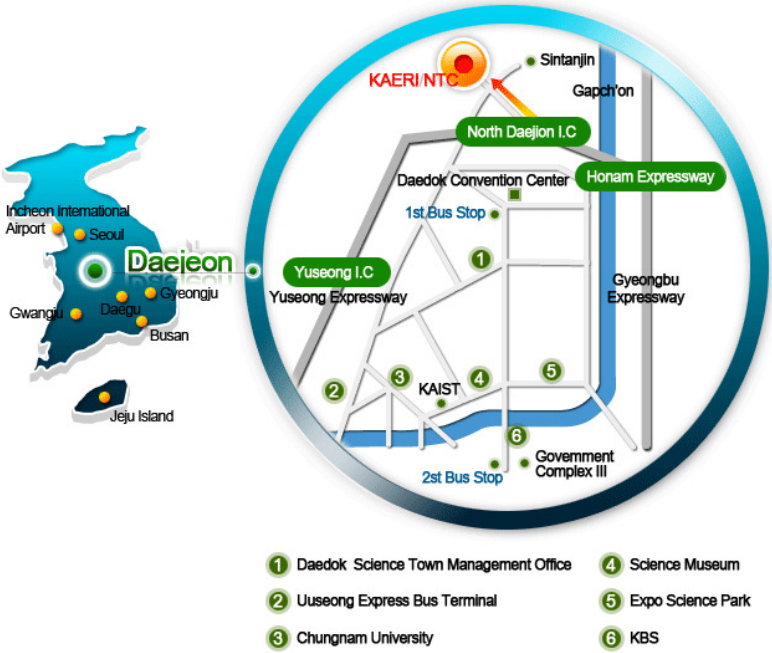
▶Fare: 14,500 won(Coach). 21,800 won(Deluxe)


Daejeon
대전관광안내지도
Tourist Map
Science Tour
Culture Tour
Nature Tour
KAERI
INTEC
Limousine
Bus Stop
Hotel
RIVIERA
대덕연구개발특구
Daedeok Innopolis
유성 구
Yuseong-gu
KAIST
대전-당진간고속국도
Expwy between Daejeon and Dangjin
천안(조치원)
유성 IC
Yuseong IC
유성온천 Yuseong Spa
북대전 IC
Buk-daejeon IC
대덕테크노밸리
Daedeok Techno Valley

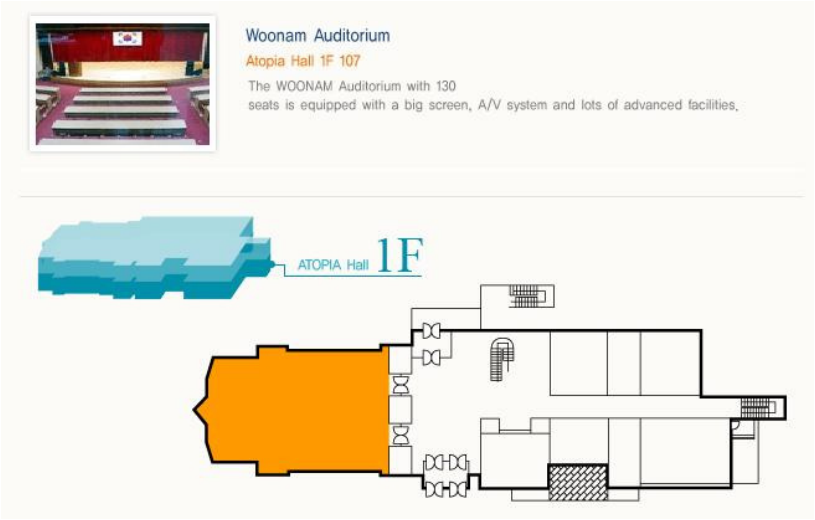
WORKSHOP VENUE

The address and Web page of workshop venue are;

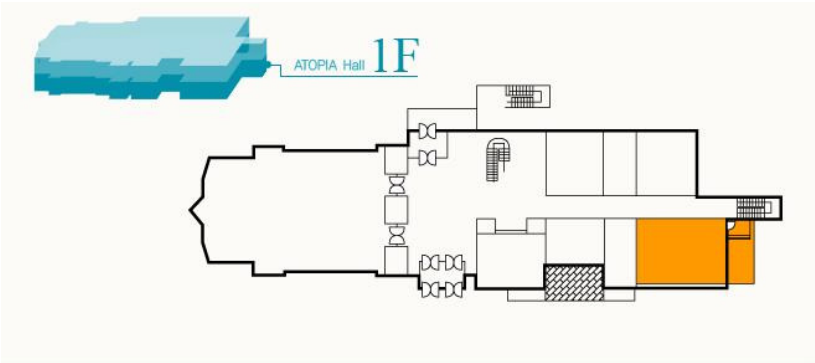
Nuclear Training and Education Center
Korea Atomic Energy Research Institute
1045 Daedeokdaero, Yuseong-gu, Daejeon, 305-353, Korea
Tel: 82.42.868.2678
Fax: 82.42.861.5018
http://www.kntc.re.kr/english/



▶Main Hall for workshop (WOONAM AUDITORIUM, 1F107)



▶Poster Area (LECTURE ROOM I, 1F 103)

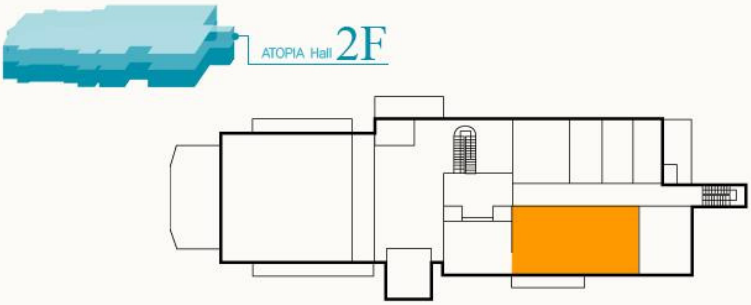


▶Parallel Discussion Area (CONFERENCE ROOM, 2F 201)

Conference Room

Atopia Hall 2F 201

This conference Room has 28 seats in a round table setting and an A/V system making it on an ideal place for convening meetings.

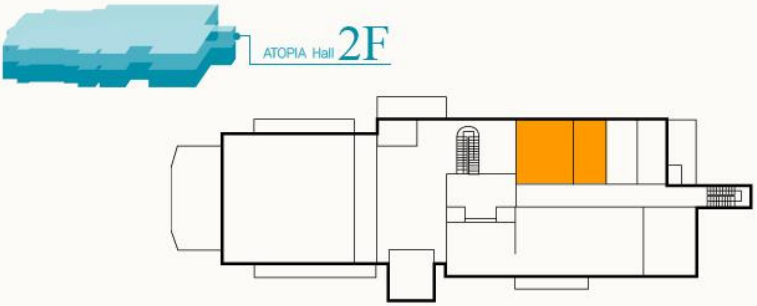


▶Parallel Discussion Area (LECTURE ROOM II, 2F 205)

Lecture Room II

Atopia Hall 2F 205

This large size lecture room with 56seats is good for workshops and meetings. In addition there are a large touch screen smart boards, a cyber lecture system and multimedia system etc.



REGISTRATION AND INFORMATION DESK

The Registration Desks are conveniently located on the 1st floor (Torch Hall) of the RIVIERA Hotel and entrance gate of the INTEC.

Registration Hours at the Workshop

Registration will take place from 14:00 to 18:00 on Sunday, 11 April at the RIVIERA Hotel. And it will also take place from 8:30 to 18:00 on Monday, 12 April at the INTEC. Thereafter the registration desk will be open as follows

Sunday, 11 April 2010(RIVIERA Hotel)	14:00 to 18:00
Monday, 12 April 2010 (INTEC, Workshop Venue)	08:30 to 18:00
Tuesday to Thursday, 13 to 15 April 2010 (INTEC, Workshop Venue)	09:00 to 18:00
Friday, 16 April 2010 (INTEC, Workshop Venue)	09:00 to 13:00

Registration Fee

Before February 15, 2010	KRW 300,000
After February 15, 2010	KRW 380,000

The registration fee covers a copy of the workshop program and an abstract book, the welcome reception, the workshop dinner, the tour and lunches at the KAERI cafeteria.

Speakers

Please note that all speakers must give their MS power point file(ppt or pptx) in USB memory at the registration desk. Those files will be distributed to every registered person as PDF file format saved in USB memory stick on Friday, 16 April 2010. Individual laptops are available. But Macintosh is not available.

Posters

The poster boards will have a single surface measuring 0.91m(width) X 1.21m(height) so they will accommodate an A0 sized poster in portrait orientation.

Facility tour, outing & PAL tour

Every registered person should inform to the registration desk whether will attend to facility tour, outing and PAL tour or not which is free.

Dinner

Every registered person should inform to the registration desk whether will attend to the dinner or not.

Lunch

All registered person can enjoy lunch during the workshop period at workshop venue.

Shuttle Service

A fare-free shuttle service will be operated between the Hotel RIVIERA and the workshop venue during the workshop period. The departure time in the morning is 08:00 AM at the hotel front gate.

Hotel RIVIERA(Front Gate) ▶ Workshop Venue : 08:00 AM
Workshop Venue ▶ Hotel RIVIERA(Front Gate)

CREDIT CARD PAYMENT REQUEST FORM

Workshop Name: **The 7th Workshop on Accelerator Operations**

Dates: **April 11 ~ 16, 2010**

Print Name on Credit Card _____

Participant's Name if different from credit card _____

E-mail Address _____

Credit Card Number _____

Card Security Code* _____

Expiration Date _____

Registration Fee (KRW) _____

Signature for credit card approval _____

* The card security code(CDC) is a 3- or 4-digit number printed in the signature field on the back of your credit card. Payment by credit card should be required to fax this form with signature.

REGISTRATION FEE

Before February 15, 2010	KRW 300,000
After February 15, 2010	KRW 380,000

The registration fee covers a copy of the workshop program and an abstract book, the welcome reception, the workshop dinner, the tour and lunches at the KAERI cafeteria.

Please fax it to +82-42-868-8131

ATTN : bspark@kaeri.re.kr

HOTEL RESERVATIONS

HOTEL RIVIERA

The Hotel RIVIERA is the official hotel of WAO10, which has been recently remodeled and well-appointed one. The hotel is conveniently located in the downtown of Yuseong, a business district of Daejeon, and 12 km away from KAERI.

The hotel offers special rates for participants to WAO10 and also shuttle service between the hotel and KAERI. Please make your own reservation by yourself through the Hotel RIVIERA Reservations Page (http://www.shinan.co.kr/yusong/eng/index_yuseong.asp). When you make your reservation, please specify WAO10 or KAERI in the Company or business field, like below, in order to obtain the special rate:

Company or business: **WAO10** or **KAERI**

The details of group rates are as follows;

Type	Rate	Available Rooms	Note
Standard Twin	KRW 108,900	30	Double
Standard Ondol Twin(Korean Style)	KRW 108,900	10	Double(no bed)
Superior Twin	KRW 133,100	30	Double
Jonior Suite	KRW 210,000	1	Single

FACILITY TOUR, OUTING & PAL TOUR

The workshop organizing office will offer fare-free guided tours during and after the workshop. Every attendee should decide what kind of tour options they will take during the registration process.

Facility Tour (Wednesday 14 April, 15:30 ~ 17:30)

- 20 MeV LINAC at KAERI
- HARARO Research Reactor at KAERI
- KSTAR Research Fusion Reactor Facility at NFRI
  (9 km away from KAERI, 20 min by Shuttle Bus)

After the facility tour, the shuttle bus will move to the dinner venue, Hotel RIVIERA.

PAL tour (Friday 16 April, 14:00 ~)

- Pohang Accelerator Laboratory
- It is 230 km away from KAERI and take 160 min by Shuttle Bus.

After PAL tour, all attendee will have dinner at Pohang University of Science and Technology(POSTECH) cafeteria and will return to Hotel RIVIERA.

Outing (Friday 16 April, 14:00 ~)

- Mt. Gyeryong National Park
- It is 21 km away from KAERI and take 30 min by Shuttle Bus.

SOCIAL PROGRAMME

All participants are recommended to sign up and make reservation for the following social events at the registration desk.

Welcome Reception, Sunday 11 April 2010, 18:00 ~ 20:00
At the Hotel RIVIERA (1F Torch Hall)

Dinner, Wednesday 14 April 2010, 18:00 ~ 20:00
At the Hotel RIVIERA (1F Torch Hall)

SCIENTIFIC PROGRAMME

Outline of each session and synoptic table of the workshop programme are included in this booklet.

Oral Presentations

Details of all oral presentations, both invited and contributed, are given in this Abstracts Brochure. Oral presentations take place at WOONAM Auditorium (1F 107) from Monday, 12 April to Friday, 16 April. *Speakers can use Power Point file as a presentation material and their laptop is also available. But Macintosh is not supported.*

Poster Session

Poster session is scheduled to be in the afternoon on Wednesday, 14 April 2010. But, posters should be mounted from Monday noon to Thursday. The panel size for poster is 0.91m(width) X 1.21m(height) so they will accommodate an A0 sized poster in portrait orientation.
The poster areas are located on Lecture Room 2 (1F 103).

ABSTRACTS BROCHURE

The workshop abstracts brochure will be published both in hard copy and electronic version in PDF format. Every attendees can have a USB memory stick containing PDF files on Friday, 16 April 2010.

MEETINGS SCHEDULED

Thursday, 15 April 2010

Parallel Discussions (16:00 ~ 17:30)

- WOONAM Auditorium (INTEC, 1F 107)
- Conference Room (INTEC, 2F 201)
- Lecture Room 1 (INTEC, 2F 205)

Thursday, 15 April 2010

PC meeting (18:00 ~ 20:00)

- Hotel RIVIERA (14F Diamond Hall)

OUTLINE OF SESSIONS

Sunday, 11 April 2010
HOTEL RIVIERA

14:00~17:30 Registration

18:00~20:00 Welcome Reception

Monday, 12 April 2010
WOONAM Auditorium (1F 107)
OPENING&HWDB I
Chairperson : M.Bieler

08:30~09:00 Registration

09:00~09:10 Opening Address *PAL Director*

09:10~09:20 Welcome Address *PEFP Director*

09:20~09:30 Break

09:30~09:50 O-01 Operation Status of the PEFP Proton Accelerator *Hyeok-Jung Kwon*

09:50~10:10 O-02 Luminosity Tuning and Operation Statistics at KEKB *Manabu Tanaka*

10:10~10:30 O-03 Pelletron Accelerator Facility - Operational Experience of Two Decades *Pramod Bhagwat*

Coffee Break (10:30~11:00)

Monday, 12 April 2010
WOONAM Auditorium (1F 107)
HWDB II
Chairperson : E. Takada

11:00~11:20 O-04 Operations of the Coupled Cyclotron Facility at Michigan State University *Andreas Stolz*

11:20~11:40 O-05 Electron Accelerator Complex at Tohoku University, 42-Year- Operation and Future *Hiroyuki Hama*

11:40~12:00 O-06 Machine Operation and Maintenance in CLS *Xiaofeng Shen*

12:00~12:20 O-07 Experiment Liaison Duties *Michael Aiken*

Lunch Break (12:20~14:00)

Monday, 12 April 2010
WOONAM Auditorium (1F 107)
Commissioning I
Chairperson : M.Spata

14:00~14:20 O-08 Commissioning of the BEPC-II Storage Rings *Qing Qin*

14:20~14:40 O-09 Commissioning and Operation of SSRF *Wenzhi Zhang*

14:40~15:00 O-10 Commissioning Experience for SLAC Linac Coherent Light Source *Michael Stanek*

15:00~15:20 O-11 Operation of RIKEN RI Beam Factory *Masayiki Kase*

15:20~15:40 O-12 Commissioning of J-PARC Main Ring *Tadashi Koseki*

Coffee Break (15:40~16:00)

Monday, 12 April 2010
WOONAM Auditorium (1F 107)
Commissioning II
Chairperson : Michael Bieler

16:00~16:20 O-13 The Operation Status of HIRFL and Commissioning of HIRFL-CSR *Jiancheng Yang*

16:20~16:40 O-14 Status of the Soreq Applied Research Accelerator Facility *Isaac Gertz*

16:40~17:00 O-15 LHC Commissioning *Rossano Giachino*

17:00~17:20 O-16 Facilities and Utilities for Driving the LHC *Markus Albert*

Tuesday, 13 April 2010
WOONAM Auditorium (1F 107)
Automation & Tools
Chairperson : G.Dodson & K.Furukawa

09:00~09:20 O-17 The GSI Operation Logbook OLog *Petra Schuett*

09:20~09:40 O-18 Pulse-to-pulse Beam Modulation for KEKB and PF Injections and Energy Management at KEK 8-GeV Linac *Kazuro Furukawa*

09:40~10:00 O-19 Electrical Power System Design of PEFP to Ensure Reliability in Operation *Kyeong-Jun Mun*

10:00~10:20 O-53 Development of the Operation Tools for the 2009 KSTAR Experiment *Sulhee Baek*

Coffee Break (10:20~11:00)

Tuesday, 13 April 2010
WOONAM Auditorium (1F 107)
Automation
Chairperson : G.Dodson & K.Furukawa

11:00~11:20 O-20 An Operators Tool for Advanced Synchrotron Injection Diagnostics *Wolfgang Bayer*

11:20~11:40 O-21 SNS Operations Tools and Automation *George W Dodson*

11:40~12:00 O-22 The PLS Operation and the Tools *Eung-Soo Park*

Lunch Break (12:00~14:00)

Tuesday, 13 April 2010
WOONAM Auditorium (1F 107)
Invited
Chairperson : K.R.Kim & Y.S.Cho

14:00~14:30 O-23 Control System for the Clinical Operation in Proton Therapy Center *Se-Byeong Lee*

14:30~15:00 O-24 Experience from HANARO Reactor Management *In-Cheol Lim*

15:00~15:30 O-25 Operational Results and Experience of KSTAR Integrated Control System *Mi-Kyung Park*

Coffee Break (15:30~16:00)

Tuesday, 13 April 2010
Lecture Room I (1F 103)
Poster
Chairperson : Q. Qin & W.Zhang

P-01 The Improvement of HIMAC-INJECTOR Operation *Hiroshi Izumiya*

P-02 Operation of Cyclotrons at RCNP *T.Yorita*

P-03 Current State of HIMAC Accelerator *Masahiro Kawashima*

P-04 Injector Linac Upgrade and Operation for the BEPCII Project *Guanghui Chen*

P-05 Design Concept of the Modulator System with Inverter Power Supply for 3.0 GeV Linac *Sang-Hee Kim*

P-06 The Monte Carlo Simulation for a Measurement of a Neutron Cross Section in the Pohang Neutron Facilities *Sung-Chul Yang*

P-07 The Operation Scenario of Beam Lines and Target Room in the PEFP Accelerator Facility *Sang-pil Yoon*

P-08 Operation Scenario of the Vacuum System in the PEFP Accelerator Facility *Hwa Ryun Lee*

P-09 DEVELOPMENT OF HIGH RESOLUTION LARGE DISPLAY FOR SPRING-8 CENTRAL CONTOL ROOM *Takashi Hamano*

P-10 Control Status of the PLS MPS Control System *J.C. Yoon*

P-11 The Control Room FERMI *Andea Apollonio*

P-12 HIMAC Irradiation System Operation, Maintenance and Troubleshooting *Kazuki Shimabukuro*

P-13 User Interface Design for PEFP Accelerator Operations *Eun-Mi An*

P-14 Estimations of the Induced Activities in the Proton Accelerator Facility of PEFP *Cheol Woo Lee*

P-15 Beam Energy Reliability by the Cooling Water Temperature of the PLS *Mun Gyung Kim*

P-16 An Automated Injection System for “Fill on Fill” Operation *Joel Trewhella*

P-17 Commissioning of the Carbon Beam Gantry at the Heidelberg Ion Therapy(HIT) Accelerator *Michael Galonska*

P-18 Improvement of MC-50 Cyclotron Tuning Module through Development of Software Program for TUM *Yeun-Soo Park*

Wednesday, 14 April 2010
WOONAM Auditorium (1F 107)
Training I
Chairperson : D.Johnson

09:00~09:20 O-26 Managing Procedural Training *Karen L. Nunez*

09:20~09:40 O-27 Non-Linear Opportunity Based Training Methods at a Small Facility. *James Morel*

09:40~10:00 O-28 Training Syllabus for RIKEN NISHINA Center *Tadashi Fujinawa*

10:00~10:20 O-29 Accelerator Operations Involvement in Project Development *Duane Newhart*

Workshop Photo Time (10:20~10:40)

Coffee Break (10:40~11:00)

Wednesday, 14 April 2010
WOONAM Auditorium (1F 107)
Training II
Chairperson : V.Toma

11:00~11:20 O-30 Utilizing Open Source Software to Manage Training *Paul Vasilauskis*

11:20~11:40 O-31 Operator Training Program at ALS: Recent Improvements *Angelic L Pearson*

11:40~12:00 O-32 Training New Operators - The First Six Months *Bruce Worthel*

Lunch Break (12:00~14:00)

Wednesday, 14 April 2010
WOONAM Auditorium (1F 107)
Ergonomics & Control Room
Chairperson : M.Stanek

14:00~14:20 O-33 SLAC Main Control Center Upgrade *Peter Schuh*

14:20~14:40 O-34 New Furniture for the DESY Accelerator Control Room *Michael Bieler*

14:40~15:00 O-35 Current Status and Future Prospect of the PEFP Control Room *Song Young-gi*

Facility Tour (15:00~17:30)
(20MeV LINAC, Research reactor & Fusion Machine)

Dinner at Hotel RIVIERA (18:00~20:00)

Thursday, 15 April 2010
WOONAM Auditorium (1F 107)
Maintenance I
Chairperson : E.Karantzoulis

09:00~09:20 O-36 Water Cooling Maintenance and Improvement. *Stefano Krecic*

09:20~09:40 O-37 Reassignment of Network Addresses at SPring-8 Control System *Takashi Sugimoto*

09:40~10:00 O-38 Maintenance Activities at Laboratori Nazionali di Legnaro *Carlucci Davide*

10:00~10:20 O-39 Maintenance Coordination at TRIUMF's Cyclotron and ISAC Facilities *Rene Tanaja*

Coffee Break (10:20~11:00)

Thursday, 15 April 2010
WOONAM Auditorium (1F 107)
Maintenance II
Chairperson : V.Toma

11:00~11:20 O-40 Maintenance Strategy of the PEFP Proton Linear Accelerator *Dae-Il Kim*

11:20~11:40 O-41 High Risk Maintenance Project at the LBNL 88-Inch Cyclotron *Jim Morel*

11:40~12:00 O-42 Transition from Shutdown to Operations *Paul W.Sampson*

12:00~12:20 O-43 HVAC Concept Design for Proton Target Room Operation *Jeon Gae Po*

Lunch Break (12:20~14:00)

Thursday, 15 April 2010
WOONAM Auditorium (1F 107)
Safety & Regulation
Chairperson : Jim Morel

14:00~14:20 O-44 User Controlled Access at NSRL *Vincent Schoefer*

14:20~14:40 O-45 Construction of the New Accelerator Safety Interlock System for SPring-8 control system *Choji Saji*

14:40~15:00 O-46 Continuity of Accelerator Operations during an Extended Pandemic *Noel Okay*

15:00~15:20 O-47 DESY Access Control System *Michael Bieler*

15:20~15:40 O-48 Implementation of Electrical Safety Procedures and Techniques for Accelerator Operations *Martin Murphy*

Coffee Break (15:40~16:00)

Thursday, 15 April 2010
WOONAM Auditorium (1F 107)
Conferenc Room (2F 201)
Lecture Room II (2F 205)

Parallel Discussions (16:00~17:30)

PC Meeting at Hotel RIVIERA (18:00~20:00)

Friday, 16 April 2010
WOONAM Auditorium (1F 107)
Reliability
Chairperson : L.Hardy

09:00~09:20 O-49 Reliably Cooling Accelerators *Don McGilvery*

09:20~09:40 O-50 Study of an Electrical Noise from Synchrotron Radiation *Yasuhide Ishizawa*

09:40~10:00 O-51 Preparation for Beam Commissioning at the LHC *Rossano Giachino*

10:00~10:20 O-52 Preliminary Measurement of Be-10 Isotope by 1MV AMS *Hwan Hong*

Coffee Break (10:20~11:00)

Friday, 16 April 2010
WOONAM Auditorium (1F 107)
Open Discussion & Closing
Chairperson : E. Takada, J. Morel & M. Stenek

Lunch Break (12:30~14:00)

Outing & PAL tour
(PAL or Gyeryong National Park)

WAO10 PROGRAM

	11 April(Sun)	12 April(Mon)	13 Aprl(Tue)	14 April(Wed)	15 April(Thu)	16 April(Fri)
08:30 - 09:00		Registration				
09:00 - 10:30		Opening&HWDB-I (M.Bieler)	Automation & Tools (G.Dodson& K.Furukawa)	Training-I (D.Johnson)	Maintenance-I (E.Karantzoulis)	Reliability (L.Hardy)
10:30 - 11:00		Coffee	Coffee	Coffee	Coffee	Coffee
11:00 - 12:30		HWDB-II (E.Takada)	Automation (K.Furukawa& G.Dodson)	Training-II (V.Toma)	Maintenance-II (V.Toma)	Open Discussion&Closing (E.Takada, J.Morel&M.Stenek)
12:30 - 14:00		Lunch	Lunch	Lunch	Lunch	Lunch
14:00 - 15:30	Registration (Hotel)	Commissiong-I (M.Spata)	Invited (K.R.Kim&Y.S.Cho)	Ergonomics&Control Room (M.Stanek)	Safety&Regulation (J. Morel)	Outing & PAL tour
15:30 - 16:00		Coffee	Coffee	Coffee	Coffee	
16:00 - 17:30		Commissiong-II (M.Bieler)	Poster (Q.Qin&W.Zhang)	Facility Tour (KAERI, KSTAR)	Parallel Discussions	
18:00 - 20:00	Welcome Reception (Hotel)			Dinner (Hotel)	PC Meeting (Hotel)	

O - 01

Operation Status of the PEFP Proton Accelerator*

Hyeok-Jung Kwon, Yong-Sub Cho, Han-Sung Kim, Kyeong-Tae Seol, Dae-Il Kim, Ji-Ho Jang, In-Seok Hong, Young-Gi Song, Eun-Mi An, Kyung-Jin Min, Sang-Pil Yun, Bum-Sik Park, Hwa-Ryun Lee

The Proton Engineering Frontier Project (PEFP) is developing a 100MeV, 20mA proton linac, which consists of a 50keV proton injector, a 3MeV Radio Frequency Quadrupole (RFQ), a 100MeV Drift Tube Linac (DTL), a 20MeV and 100MeV beam transport lines. As a front end part of the 100MeV machine, the 20MeV proton linac was installed at Korea Atomic Energy Research Institute (KAERI) site and has been operating since 2007. The main purposes of the 20MeV linac operation at KAERI are to supply proton beam to users and to study the characteristics of the machine itself and its components. In this paper, the development of the PEFP proton accelerator including 20MeV linac operation is presented and the operation plan of the 100MeV machine based on the 20MeV linac experience is discussed.

* This work is supported by the Ministry of Education, Science and Technology of the Korean government.

O - 02

Luminosity Tuning and Operation Statistics at KEKB

Manabu Tanaka , Yoshihiro Funakoshi

The KEKB B-Factory (KEKB) started a collision experiment in 1999 and achieved the design luminosity of 10/nb/s in May, 2003. We achieved 21.1 /nb/s (more than the double of the design luminosity). The integrated luminosity surpassed 1000 /fb in 2009. We routinely make tuning on machine parameters related to beam collision even during the physics experiment. The purpose of this adjustment (called "knob tuning") is to maintain the high luminosity by optimizing the collision parameters and to obtain an even higher luminosity. We installed crab cavities in February, 2007. The method of luminosity tuning changed to some extent and some new tuning methods were introduced. We installed skew sextupole magnets in March, 2009 and the e+/e- simultaneous injection scheme was realized. After those, the peak and integrated luminosity improved drastically. We also describe the operation statistics.

O - 03

Pelletron Accelerator Facility - Operational Experience of Two Decades

P V Bhagwat, A.K.Gupta, J.A.Gore, P.Surendran, S.G.Kulkarni, N.Mehrotra, S.C.Sharma, Ramlal, J.P.Nair, Q.N.Ansari, U.V.Matkar, Ramjilal, N.G.Ninawe, R.N.Lokare, M.L.Yadav, J.K.Yadav, M.Ekambaram, Hillary Sparrow, P.V.Gudekar, P.C.Bolar, G.K.Nikam, R.K.Choudhury, S.Kailas

The Pelletron Accelerator Facility has been set up under a collaborative project of the Bhabha Atomic Research Centre (BARC) and the Tata Institute of Fundamental Research (TIFR) at the campus of TIFR in South Mumbai, India. The facility is based on a 14 million volt tandem electrostatic accelerator capable of providing ion beams such as protons, alpha and different types of heavy ions at energies sufficiently high for conducting nuclear research in a variety of new and interesting regimes. The accelerator has been in operation for last twenty one years with progressively increased efficiency. An ion source test bench has been set up for development of various ion beams. Recently, Beryllium beam is successfully accelerated after complying with safety norms. The technique of multi-element cathode samples has been indigenously developed to extract different ion species from the same cathode and work on multi-cathode SNICS ion source is at advanced stage of completion. The original NEC column structure had corona grading for potential distribution, which has been replaced by a resistance grading system. As a result, the performance of the accelerator has improved significantly. The accelerator has a high uptime and routinely operated on higher side at 12 MV and on lower side at 2.5 MV. A double drift tube harmonic buncher, operating at 10 & 20 MHz, has been developed indigenously to pulse the dc

beam to 1-2 ns pulse width. The buncher has been in operation for last several years.

In the initial years there were problems of failure of charging chain, couplers and bearings of rotating shaft, fibre optic cables, foil stripper etc. All these problems were resolved systematically, and by year 1993 the accelerator performance improved significantly. In the recent years, various accelerator based application programs such as accelerator based mass spectrometry (AMS), production of track-etched membrane, high current irradiation for production of radioisotope etc. have been initiated.

An alternate injector project of ECR source, room temperature radio frequency quadrupole (RFQ) and low β cavity using Nb technology is on the anvil.

This paper discusses the detailed operational experience with our facility for last two decades

O - 04

Operations of the Coupled Cyclotron Facility at Michigan State University

Andreas Stolz

As the largest university-based nuclear science user facility in the U.S., the National Superconducting Cyclotron Laboratory (NSCL) at Michigan State University plays a leading role in rare isotope research and nuclear science education. The Coupled Cyclotron Facility at NSCL produces word-class beams of rare isotopes using the in-flight separation technique. More than 1000 rare isotope beams have been produced since 2001. Rare isotope beam production is accomplished by an experienced team of beam physicist within 4 to 12 hours. NSCL typically operates for a total of 5000 hours per year with an availability of over 90%. A quality management system certified according to ISO 9001 helps to ensure high facility availability and user satisfaction.

O - 05

Electron Accelerator Complex at Tohoku University, 42-Year-Operation and Future

H. Hama, M. Kawai, H.Hinode, Y. Shibasaki, S. Takahashi, K. Nanbu, I. Nagasawa, T. Muto, M. Hiraga

An electron linac has been operated for 42 years at Laboratory of Nuclear Science, Tohoku University. The linac, constructed as the first machine for high energy nuclear physics at universities in Japan, is consists of 5 klystron modulators and 20 accelerating structures. Though the maximum beam energy was 300 MeV at the beginning, now 220 MeV maybe the maximum because of deterioration of shunt impedance of the accs. The maximum macropulse current is limited to be about 80 mA at the beam energy higher than 100 MeV due to beam brow-up. The machine was really designed by old fashioned style then quadrupoles were not distributed properly, which is a reason of the lower maximum curent. The linac is now used as an injector for a 1.2 GeV booster synchrotron that was constructed in 1996 for hadron physics, and another role is a radio isotope producer by irradiating targets with 300 Hz repetition rate. We will report on experience of operation and maintenance of the accelerators and discuss future of the laboratory as an accelerator-based laboratory.

O - 06

Machine Operation and Maintenance in CLS

Xiaofeng Shen, Hao Zhang

The Canadian Light Source (CLS) is a third generation synchrotron radiation source that started operation in 2004. During the five years operation, the machine operation and maintenance have been improved. In this paper, the operator management and decreasing the conflict between new beamline installation and maintenance have been described. Using grid indicator matrix and tabbed window based display for diagnosis and screen navigation has been discussed.

O - 07

Experiment Liaison Duties

Michael Aiken

The continuous electron beam accelerator facility (CEBAF) at Jefferson Lab (JLAB) hosts unique and specialized experiments simultaneous with routine experiments in other end-stations. These unique experiments often have specialized beam requirements, new beamline configurations including diagnostic devices, and well defined commissioning periods. Each experiment's needs are different, so the Jefferson Lab Operations Group assigns an Experiment Liaison, a single crew chief or operator who works directly with experiment representatives during planning, commissioning and installation. This poster shows how the Experiment Liaison plays a key role in planning the beam instrumentation requirements, drafting experiment-specific setup procedures, and training Operations staff before the first beam is ever delivered to the experiment.

O - 08

Commissioning of the BEPC-II Storage Rings

Qing Qin for the BEPC-II commissioning team

The upgrade project of the Beijing Electron Positron Collider (BEPC-II) aims at the luminosity of 3 to 10*10^{32} cm^{-2}s^{-1} at the beam energy of 1.89 GeV, and a stable beam performance to the synchrotron radiation (SR) users with a higher beam current at 2.5 GeV. After the construction of the BEPC-II, the commissioning of the storage rings started from 2006. After two and a half years running, including luminosity commissioning and operation for both high energy physics and SR, the machine reached its design value in the May of 2009. Here we reviewed the commissioning of both collision and SR modes.

O - 09

Commissioning and Operation of SSRF

W.Z. Zhang L.X.Yin Z.T. Zhao H.H.Li

The Shanghai Synchrotron Rediation Facility(SSRF), a 3rd generation synchrotron light source with the energy of 3.5GeV, was successfully commissioned in 2009. All the beam parameters are reached their design values.From May 2009, the facility was open to users. The commissioning and operational status of SSRF are reviewed in this paper.

O - 10

Commissioning Experience for SLAC Linac Coherent Light Source

Michael Stanek

SLAC National Accelerator Laboratory뭘 Linac Coherent Light Source (LCLS), was sucessfully comissioned in 2009, bringing high intensity, sub-picosecond X-rays to users. The LCLS utilizes part of the existing SLAC 3-km linear accelerator to produce short, intense, low emittance electron bunches over a range of 4 to 13.6 GeV. The electrons are guided with trajectory tolerances of <10 um rms through a series of undulator magnets. The resultant 멈icro-bunched?electrons interacting with the photons generated in the undulators create coherent X-rays of extremely high brightness, from 800eV to 8 KeV, for use in atomic, molecular, and material science studies. User availability goals of >95% were met during the first user runs of October-December 2009. The talk will describe several aspects of the staged commissioning effort from 2007 to 2009. Key elements were the collaborative organization of accelerator physicists and operators, a multi-faceted training program, and well constructed commissioning plans.

O - 11

Operation of RIKEN RI Beam Factory

Masayuki Kase

RIKEN RI Beam Factory (RIBF) has four large-scaled ring cyclotrons aiming high intensity heavy-ion beams with energy like 350MeV/nucleon. It completed in 2007 and It passed three years since the RI beam factory provied variety of beams to the RI beam generatot called BigRIPS. Opearional cimmisioning of RIBF during these three years will be reported. Its operatiion has a number of parameters, combimation accelrators, Ion-species, frequency, etic.

O - 12

Commissioning of J-PARC Main Ring

Tadashi Koseki and J-PARC commissioning team

J-PARC Main Ring started its beam commissioning on May 2008, after 4 years of construction. Now it delivers 30GeV proton beam to the neutorino experimental facility and the hadron experimental hall. J-PARC MR commissioning still continues until the design value of beam power, 750KW will be achieved. Status of MR and the experience in its beam commissioning will be reported.

O - 13

The Operation Status of HIRFL and Commmssioning of HIRFL-CSR

Jiancheng Yang,Hongwei Zhao,Jiawen Xia,Youjin Yuan,Xiaodong Yang,Mingtao Song,Yiping Yang,Yong Liu,Lijun Mao,Dayu Yin and HIRFL Operation Group

The HIRFL complex consists of a main ring (CSRm), an experimental ring (CSRe) and RIB production and transfer line (RIBLL2) between them. The two cyclotrons SFC (K=69) and SSC (K=450) are used as injectors. The SSC was put into operation in the beginning of 1989 and HIRFL was found as national laboratory from 1992. Many upgrading items were carried out for the SFC and SSC to improve the beam intensity, beam quality and operation efficiency. The Cooling Storage Ring (CSRm and CSRe) was constructed from 2000 and commissioning activities were performed in 2006 and 2007. The first operation was carried on in 2009. Up to now, the injector system of cyclotron (SFC+SSC) can provide all ions from proton to uranium with high intensity. The heavy ions of C, Ar, Kr, and Xe was successfully accumulated and accelerated in CSRm with the combination of stripping injection (STI) or multiple multi-turn injection (MMI) and e-cooling with a hollow electron beam. The high charged state beams and RIBs from CSRm stacked in CSRe for internal target experiments and RIBs mass measurement with the isochronous-mode. In this paper, the HIRFL complex operation status and CSR commissioning was presented, the researches based on the HIRFL complex are described.

O - 14

Status of the Soreq Applied Research Accelerator Facility

I.Gertz, I. Mardor, D. Berkowitz, L. Weissman, A. Perry

The Soreq Applied Research Accelerator Facility, SARAF, is currently under beam characterization tests at Soreq NRC. SARAF is based on a continuous wave (CW), proton/deuteron RF superconducting linear accelerator with variable energy (5?40 MeV) and current (0.04-2 mA). SARAF linac is designed to enable hands-on maintenance, which implies beam loss below 10-5 for the entire accelerator. Phase I of SARAF consists of a 20 keV/u ECR ion source, a low energy beam transport section, a 4-rod RFQ, a medium energy (1.5 MeV/u) transport section, a superconducting module housing 6 half-wave resonators and 3 superconducting solenoids, a diagnostic plate and a beam dump. Phase II will include 5 additional superconducting modules. The ECR source is in routine operation since 2006, the RFQ is in routine operation with protons since 2008 and has been further operated with molecular hydrogen and deuterons at low duty cycle. RF conditioning of the RFQ to enable deuteron CW acceleration is on going. The superconducting module is being operated and characterized with protons. SARAF Phase I commissioning results are presented.

O - 15

LHC Commissioning

Roger Bailey, Mr. Rossano Giachino

Following 6 years of construction and testing from 2002, commissioning of the LHC with beam started in the third quarter of 2008. After a very promising start, a serious equipment fault on September 19 2008 caused considerable collateral damage to the machine. Repair and consolidation took over a year, and beam commissioning resumed in late 2009. A technical stop of a few weeks was required in early 2010, with beam operation continuing from March 2010. Against this backdrop, the status of LHC is presented.

O - 16

Facilities and Utilities for Driving the LHC

Markus Albert

The rapid and successful start to beam commissioning of the LHC was made possible by the array of facilities that were available in the control room from day 1. The integrated software architecture, providing a unified interface to the operators and allowing the implementation of a machine-wide task sequencer, was stable and available even before first beam. Powerful applications for driving beam instrumentation worked on the first day or very soon afterwards, providing operations with a comprehensive set of diagnostic tools for measurement and correction of all machine parameters.

O - 17

The GSI Operation Logbook OLog

P. Schuett, W. Bayer, D. Pfeiffer, S. Reimann, U. Scheeler, M. Stein

In 2005, the GSI Operations Group started the development of a database-connected Operating Logbook, which is in use since 1.1.2007. Special features are e.g.:

- the automatic balancing of beam time for each of the running experiments;
- the documentation of settings and of beam parameters with a search function to retrieve data from previous beam times;
- or direct communication of bugs and malfunctions to the responsible groups.

Write access is restricted to the current shift crew during their shift to meet legal requirements on logging. Reading access has been opened to the other groups in the accelerator department to ease communication and a separate public view web page is provided to show the accelerator status to the experimenters.

Features of the OLog and experience both with the development and with the use of it will be presented in this contribution.

O - 18

Pulse-to-pulse Beam Modulation for KEKB and PF Injections and Energy Management at KEK 8-GeV Linac

Kazuro Furukawa, Yujiro Ogawa, Takuya Kamitani, Yukiyoshi Ohnishi, Masanori Satoh, Shiro Kusano

KEK 8-GeV linac injects electron and positron beams into KEKB HER, LER and PF rings at different energies switching at 50Hz. A multi-energy beam optics was designed to accommodate static quadrupole magnet fields. As the beam energies (8GeV, 3.5GeV and 2.5GeV) and bunch charges (0.1nC to 10nC) are very different, configuration of RF phase and timing is changed pulse by pulse, and the beam for PF is decelerated at a part of linac. Furthermore, we sometimes have one of RF stations out of order, and a backup station replaces it. Thus, the energy management is important for the linac operation both to design beam optics and to modify it during the operation. The present status and the upgrade towards the SuperKEKB project are described.

O - 19

Electric Power System Design of PEFP to Ensure Reliability in Operation

Kyeong-Jun Mun, Gye Po Jeon, Sung Sik Park, Jin Sam Cho, Yi-Sub Min, Jung Min Nam, Jun Yeon Kim

Proton Engineering Frontier Project (PEFP) is now in the construction of Proton Accelerator Research Center until 2012. In Proton Accelerator Research Center Construction, it is indispensible to design electric power system for the reliable electricity supplies to the accelerator and conventional facilities.

In this paper, we describe monitoring & control system for the electric power system and emergency power system of PEFP to ensure reliable operation for the accelerator and conventional facilities of PEFP. In monitoring & control system design procedure, we designed monitoring & control logic of each power system component for the recognition and control of the abnormal operation. We also designed emergency power system, such as diesel generator system, uninterruptible power supply system (UPS) and DC power system, to provide indispensible electric power for the accelerator and conventional facilities safety & reliability when the electric power of the transformer is lost due to any reason.

O - 20

An Operators Tool for Advanced Synchroton Injection Diagnostics

W. Bayer, G. Fr?lich, W. Kaufmann, U. Scheeler, P. Sch?t, Ch. Wetzel

The operation of an accelerator facility like that at GSI Helmholtz Center for Heavy Ion Research near Darmstadt, Germany is very complex. The beam setup for a dedicated experiment requires the measurement of several beam parameters, e. g. stripping efficiency, energy, revolution frequency and so on. Different beam diagnostics along the accelerator and beam transport lines provide for this purpose appropriate signals. As beam time is rare due to great demand the operators are asked to setup beam in less and less time. One approach to enable that is to simplify the handling of beam diagnostic tools and to preprocess those signals so that the operator gets a measurement result in a minimum of time.

We report on the development of our Schottky analysis in the SIS18 as an example for that. The history is summarised and the control room front end is presented.

O - 21

SNS Operations Tools and Automation

Charles C. Peters, Nicholas P. Luciano, Tim B. Southern

At the Spallation Neutron Source operational tools are being developed to reduce operator induced downtimes, as well as improve issue diagnosis and machine recovery times. Operator downtimes usually occur while doing simple repetitive tasks. To try to eliminate these errors, operators have created EPICS based sequences to automate these tasks. For further improving issue diagnosis and machine recovery times an html based tuning guide, system specific wiki pages, and sharepoint sites have been created. These sites detail simple and complex procedures, common issues, and in the case of sharepoint inter-group conversation. Operations also continues helping to keep the Best Ever Alarm System Toolkit up to date with important alarms.

O - 22

The PLS Operation and the Tools

Eung-Soo Park, Eun-Hee Lee, Mun-Gyung Kim,Sung-Ju Park,
and Kyung-Ryul Kim

The Pohang Light Source(PLS) is one of the third-generation light sources of 2.5 GeV electron energy. The Pohang Accelerator Laboratory (PAL) has started the PLS operation in 1995. PLS has employed and developed many application tools for operations. Now the upgrade project called PLS II is ongoing with the goal of improvements to 3.0 GeV, 400 mA, and 5 nm*rad emittance. The operational tools of PLS should be reorganized to facilitate the commissioning and operation of PLS II at the end of 2011. This paper will review the operational tools and a blue print of the PLS control room.

O - 23

Control System for the Clinical Operation in Proton Therapy Center

Se Byeong Lee

National Cancer Center (NCC), an organization that specializes in the cancer research, the treatment, and the education, introduced a Proton Therapy Facility in 2003 and started the first patient treatment on March 19, 2007. The facility consists of a cyclotron (Proteus 235) accelerating proton to 230MeV, 3 patient treatment rooms, and 1 experimental site. It is developed for clinical use as a commercial model by IBA, Belgium. We treated 519 cancer patients by 2009 in the facility. Our operation experience for last 3 years and the control system for the clinical use will be presented.

O - 24

Experience from HANARO Reactor Management

In Cheol LIM

HANARO, which is a 30 MW open-tank-in-pool type multi-purpose research reactor, has been operated by KAERI since its initial criticality in Feb. of 1995. It is a sole neutron source in Korea and being utilized for neutron science, material test for power reactor fuel and material development, radio-isotope production, neutron activation analysis and semiconductor production. Considering that HANARO is the first experience of Korea in high power research reactor, new trials or new techniques were evolved and applied during construction, commissioning, operation and utilization. These included the various activities in the establishment of organization, turn-over of facilities between the project phases, the establishment of user communities and the facility safety management. These experiences are believed to be good references for the establishment similar large-scale scientific facilities.

O - 25

Operational Results and Experience of KSTAR Integrated Control System

Mikyung Park and KSTAR Control Team

The KSTAR(Korea Superconducting Tokamak Advanced Research) is the newest superconducting tokamak to have a mission to perform fusion researches for future energy source, which accomplished the 1st plasma in 2008 after the completion of design, fabrication and assembly since 1995. Also, the KSTAR integrated control system (KICS) has been developed to integrate various types of plant I&Cs and data acquisition systems, and perform KSTAR tokamak operation and plasma experiments which are substantially different from the other experimental facilities in operation. Through the last 2 campaigns, the KICS has successfully performed the essential missions and also proved the performance of EPICS for tokamak control. The noticeable results affected the decision of a middleware for ITER CODAC system.

O - 26

Managing Procedural Training

Karen Nunez

There are nearly 360 procedures maintained at the Advanced Light Source for the operations staff of Accelerator Operators, Floor Operators, Engineers and Technicians. Over the course of the year, procedures undergo revisions due to equipment and software upgrades, changes and improvements in processes, changes in staff responsibility, or else corrections that are noted during a relevancy review.

Given that typically one-third of the procedures are revised annually, the effort involved to send notification, retrain staff, and maintain training records can become overwhelming. This presentation will provide an overview of a how procedural training is managed through the use of the Procedures Training Database. We will take a look at:

- Forms of re-training, including read & understand, hand-on, and online training, and how these are documented
- the database interface and the different ways supervisors can view their group training
- how supervisors manage their group training
- sample reports based on various queries

Toward the end of this presentation, discussion can be opened to share what different sites do to encourage staff members to maintain training as procedures are updated or newly developed.

O - 27

Non-Linear Opportunity Based Training Methods at a Small Facility

Jim Morel

The 88-Inch Cyclotron at Lawrence Berkeley National Laboratory is a small facility with four operators and a training program that has to cover a wide range of machine configurations, ions, energies and intensities while the Cyclotron remains operational. I will compare our training program to a conventional training program that is designed for many trainees, where there is a structured training program with set sequence of milestones to be achieved with a certain predictable efficiency. We are a facility with one trainee every 1-2 years and a small training program that must take advantage of machine configuration opportunities as they present themselves. First the trainee acquires basic theoretical knowledge to be able to speak accelerator. Then based on the Cyclotron's schedule, the trainee will move to learn systems and skills needed to participate in the ongoing Cyclotron operational objective of delivering the scheduled beam on target. The trainee must take advantage of the learning opportunity when a specific machine configuration presents itself because it may not be repeated for a long time. This is non-linear training; it forces flexibility, it put the onus on the trainee to take advantage of the operational schedule, it allows the trainee to learn what is needed for each tune and integrates the trainee into the culture of owning the quality of one's tune from an early stage of their training. The learning of the ownership of being the Operator-in-Charge is a fundamental objective of the training program and is a major thread in all the training experiences. In the long run it is felt that this is a more efficient training method for this small facility.

O - 28

Training Syllabus for RIKEN NISHINA Center

Tadashi Fujinawa

RIKEN NISHINA center갿s RI Beam Factory is currently under service for nuclear physics. After WAO07 experimental facilities are constructed and some are in progress.

This time we will explain our training curriculums that are based on legal and RIKEN safety code. In 2009, we received?40 experimenters and 6 operators as freshman.

Our syllabus is consisting of, guidance, sturdy for engaged person under radiation control area and special training for low voltage electrical handling and these are for everyone. Medium voltage, liquid nitrogen and acquirement course for crane operation are available as necessary.

Operation skills are transferred mainly by OJT. And in case of any incident, the manual will be revised and additional facility will be furnished, as necessary.

O - 29

Accelerator Operations Involvement in Project Development

Newhart

As new projects are brought online at Fermilab, the Accelerator Operations Department continues to play a role during the project development, installation and commissioning phases. My presentation will focus on contributions from Accelerator Operations Department during the development and installation phases of a project, and highlight areas of concern from the operations perspective.

Using examples from Main Injector installation project, the Booster Corrector Upgrade and the current Muon Test Area project I'll explore common issues for operations group that include integrating a new project into the control room environment, developing search and secure procedures, and eliminating exceptional conditions for a new project.

O - 30

Utilizing Open Source Software to Manage Training

Paul Vasilauskis

At Jefferson Lab, Moodle, an Open-Source Course Management System has been used to produce a comprehensive web-based training program for accelerator operators and crew chiefs. The system is simple to use, self-paced, completely trackable, and able to tie into the lab's overall training infrastructure. Moodle serves as the on-line engine that ties together a variety of new and existing materials, including multimedia, and makes the training system manageable without large manpower requirements. This poster session shows how experienced crew chiefs, operators, and system experts create the courses, what the students see as they learn, and how the training each student has received is quantified and tracked.

O - 31

Operator Training Program at ALS: Recent Improvements

Angelic Pearson

Operator Training at the Advanced Light Source is comprised of documented, procedural training, classroom training, and on-the-job training. The goal of ALS Operator Training is to promote certainty, self-confidence, and above all else safety while operating the Advanced Light Source. Proper training is critical to the safe operation of the facility. Duties for the Operations Group are separated into Accelerator Operator (AO) tasks which are focused on the accelerator and operation of facility process systems and equipment and Floor Operator (FO) tasks which are focused on support on the experimental floor. Although AO training in the past has taken from 8 months to 24 months to complete, current efforts are being made to bring the training time down to 6 months. FO training typically takes 5 months to complete.

Training requirements are documented in a written procedure, and trainees are paired with a training mentor to guide and encourage them through the process. In 2008, a Training Committee was formed to facilitate improvements in training practices for new employees as well as ongoing re-training of current employees. In my presentation, I will discuss ways that we maximize the effectiveness and efficiency of the training process. I look forward to learning best practices from other facilities.

O - 32

Training New Operators - The First Six Months

Bruce Worthel

The Fermilab Operations Department takes about two years to train a new Operator. The Operator's introductory OJT (Concepts) gives him or her an overview of the laboratory, teaches the basics facts about all the accelerators, and it also teaches the new operator the training process used for all the rest of their OJT training. The Concepts OJT takes about four to six months for most people to complete. This talk will explain how this first six months of training sets the new employee on their path to becoming a fully trained Operator.

O - 33

SLAC Main Control Center Upgrade

Peter Schuh

Faced a two month down period and a major shift in the accelerator program from PEP-II to LCLS, the SLAC Main Control Center operations staff took the opportunity to remodel the existing control room to update workstation and overhead display hardware, as well as address ergonomic problems and improve interaction between operators and commissioning physicists.

The new design incorporates Linux workstations as the primary control system interface, with SunRay workstations and an array of large overhead display monitors. Console workspace is a custom built countertop with cutouts for each workstation. Lighting and ergonomic factors were considered in the design. Budget constraints required careful choices of hardware and a phased implementation.

O - 34

New Furniture for the DESY Accelerator Control Room

M. Bieler

After 32 years of operation, the consoles in the DESY accelerator control room were replaced by new furniture. This talk describes the features of the new consoles, how they were arranged in the room, and some other changes to create a better working environment.

O - 35

Current Status and Future Prospect of the PEFP Control Room

Song-Gi Song, Eun-Mi An, Hyeok-Jung Kwon,
and Yong-Sub Cho

The PEFP (Proton Engineering Frontier Project) is developing 100-MeV linac comprising an ion source, a RFQ (Radio Frequency Quadrupole), DTL (Drift Tube Linac), and beam lines. The control room for the 20-MeV linac installed at KAERI was initially constructed in 2007. The control room allows operators to control devices and monitor operation parameters. The main control room of the 100-MeV linac is being designed to give more environmental condition to operators. The main purpose of the design is to prevent downtime of control system like workstations, servers, etc. The present status and conceptual design of the control room for the PEFP accelerator complex are given.

This work is supported by the Ministry of Education, Science and Technology of the Korean government.

O - 36

Water Cooling Maintenance and Improvement.

A. Apollonio, S. Krecic

The improvement in orbit stability obtained at Elettra in the last years showed a significant dependence of the performance to the water cooling and air conditioning. Water cooling of the various components at Elettra appears to be an essential part of the safety and longevity of many components of the accelerator but also a significant parameter for the beam quality.
Some new project has been developed to improve the water cooling and air conditioning system for a better beam quality and stability.

O - 37

Reassignment of Network Addresses at SPring-8 Control System

T. Sugimoto, M. Ishii, T. Ohata, T. Sakamoto, and R. Tanaka

Nowadays, Ethernet and TCP/IP are commonly used as field bus of accelerator control system. At the SPring-8, TCP/IP have been used since the facility settled in 1997. However, by increasing the number of network-connected devices, many network problems have been arisen. For example, a lot of broadcast traffic affects embedded devices hang-up, because our control-system network consisted of one network segment and the broadcast segment was too large.[1] Another problem was exhaustion of IP addresses in the network segment. To measure these problems, we performed reassignment of network addresses of the control system. We will report procedure of the reassignment and the improvement of control-system network.

[1] T. Sugimoto et al., Proceedings of PCaPAC2008, THX03 (2008)

O - 38

Maintenance Activities at Laboratori Nazionali Di Legnaro

D. Carlucci, A. Lombardi, P. Posocco, C. Osvaldo, D. Giuseppe

The Laboratori Nazionali di Legnaro (LNL) is a centre for applied and nuclear physics founded in 1960 in Legnaro, Padova (Italy). At the beginning the centre was equipped with a 7MV Van de Graaf accelerator and, since then, a new machine has been installed roughly every 10 years, namely a 2MV van de Graaf accelerator, a 14MV Tandem XTU, a super-conducting 58MV booster (ALPI) and finally a super-conducting 12MV injector (PIAVE). Because of the different wear of these accelerators due both to use and age, various approaches to their maintenance have been envisaged: planned, opportunistic preventive, recovery after failure and radical update/upgrade. In this paper we analyze these methods applied to specific cases and we describe the smooth transition from an all-on-paper to all-on-DB logbook of the daily activities and faults. In addition the Work Permitting procedures in force at the moment at LNL are explained.

O - 39

Maintenance Coordination at TRIUMF's Cyclotron and ISAC Facilities

Rene Tanaja

TRIUMF's facilities include the 500MeV cyclotron and ISAC, the heavy ion linear accelerator, each run by a specialized operations group from a separate control room. Maintenance coordination for each facility is conducted by its operations group. The most considerable and extensive jobs and upgrades are executed during two extended shutdown periods, one in winter, and one in autumn. During the rest of the year, handling of regular maintenance issues has recently been changed from weekly to a provisionally monthly schedule. More maintenance days are tentatively arranged in-between, to be used on a necessity basis. Available operators often assist in maintenance jobs, if needed and requested, especially during the shutdown periods. Changes in the organization of the two operations groups and how these affect the consolidation of maintenance procedures between the two control rooms will be discussed in this presentation.

O - 40

Maintenance Strategy of the PEFP Proton Linear Accelerator

Dae-il Kim, Hyeok-Jung Kwon, Han-Sung Kim, Kyeong-Tae Seol, Young-Gi Song, Hwa-Ryun Lee and Yong-Sub Cho

A 100 MeV proton linear accelerator is being developed by Proton Engineering Frontier Project (PEFP). As a front end of the 100 MeV machine, the 20 MeV proton linear accelerator was installed at Korea Atomic Energy Research Institute (KAERI) site, and supplied the beam to users since 2007. In the 20 MeV proton linac, the scheduled maintenance relating the preventive maintenance for the various components is planned in the summer and winter periods. The unscheduled maintenance like a critical repair of the machine always exists. To reduce the time required to repair the machine, the spare parts for the critical and long delivery time components are prepared. The experience on the 20 MeV proton accelerator will be used to set up the maintenance schedule and items for the 100 MeV linac. This paper presents and discusses the scheduled and unscheduled maintenance strategies for the PEFP proton linear accelerator.

* This work is supported by the Ministry of Education, Science and Technology of the Korean government.

O - 41

High Risk Maintenance Project at the LBNL 88-Inch Cyclotron

Jim Morel

The 88-Inch Cyclotron has been operating for 48 years at Lawrence Berkeley National Laboratory. This talk will describe the repair/maintenance of a vacuum O-ring seal of the accelerating Dee뭘 plate that had not been replaced or serviced in over 35 years. The process to move the 14 foot 2000 pound cantilevered acceleration Dee out of the Cyclotron required an extensive planning and coordination effort. The risk of failure was significant and made the prospect of doing this O-ring replacement an operational challenge. The Dee pull and the O-Ring repair will be described. The process of managing the work will be described. The coordination and training of the technicians to be fully prepared for the anticipated problems proved to be well worth the effort. The need to adjust the work plans during the job and the constant use of ISM process of planning each day using the previous day뭘 feedback helped steer the work though the many problems encountered. This project relied on the skills of the in house operations and engineering support staff to solve never before seen problems.

O - 42

Transition from Shutdown to Operations

Paul W.Sampson

One of the most challenging periods of the year at BNL's collider Accelerator complex is RHIC start up. It is then that all of the accelerators including a Tandem Van de Graaff, a LINAC, a Booster, a Post Booster (the AGS) and the main rings at RHIC must evolve from shutdown to running mode. During shutdowns, which are typically several months long, many major construction, upgrade and replacement projects are completed as well as most of the major preventive maintenance. In order to achieve the goal of starting Physics running on time, it has been shown that an early start to the recovery process is essential. Reality demands that startup occurs as late as possible as, almost invariably, ambitious shutdown projects need all of the available time (and then some). This paper will discuss some of the methods that have been developed start up at RHIC and recent experiences executing them. Specific problem and solutions to these as well as the process by which improvements have been made will be out lined Plans for further improvements will also be discussed. In closing I will discuss the effects of other users, such as NSRL (NASA Specs Radiation Lab), now accelerators (EBIS), outside industry and machine studies on the overall startup process.

O - 43

HVAC Concept Design for Proton Target Room Operation

Gye Po Jeon, Yi sub Min, Jun Yeon Kim, Jin Sam Cho, Kyeong-Jun Mun, Jung Min Nam, Sung Sik Park

In PEFP's proton accelerator research center, 10 proton beam targets are going to be installed : 5 targets in 20MeV beam extraction and another 5 in 100MeV beam extraction. their operation scenarios, radiation shielding analysis, and worker access scenario were completed to implement the concept of target operation above.
In this context, the concept of HVAC system is studied which is necessary for the target rooms. At first, air from target room and BTL enclosure is designed to go through plenum which keep its activation to stay within the allowable level of Discharge Control Standard. Also, Dual supply and exhaust valves are designed to enhance safety of HVAC system.

O - 44

User Controlled Access at NSRL

Peter Ingrassia, Vincnet Schoefer

The NASA Space Radiation Laboratory (NSRL) is a user facility that utilizes heavy ions extracted from the AGS (Alternating Gradient Synchrotron) Booster for radio-biology and physics experiments. Irradiations are short, ranging from a few tens of milli-seconds to hours requiring frequent access to the target room. Over the course of a year Principal Investigators will enter the target room 4000 or more times to place and retrieve samples. This talk will describe the User Controlled Access system that was developed to eliminate the need for accelerator operators or other on-shift personnel to control the access to the target room.

O - 45

Construction of the New Accelerator Safety Interlock System for SPring-8

C. Saji, H. Hanaki, S. Hashimoto, Y. Hashimoto, M. Kago, K. Kawata, T. Masuda, T. Matsushita, S. Miyamoto, T. Nagaoka, N. Nariyama, H. Ohkuma, K. Soutome, S. Suzuki, M. Takao, R. Tanaka, M. Toko, Y. Tsuzuki, A. Yamashita, H. Yonehara

The radiation safety interlock area in SPring-8 consists of five accelerator/beam-transport areas. The injection beam transportation can be frequently changed between the two accelerator areas; SPring-8 storage ring and NewSUBARU storage ring, thus the radiation safety interlock system has to process the complicated safety logic to handle such a switching operation. The safety interlock system, which protects persons from radiation hazard induced by electron beams and synchrotron radiation, has been operating over a decade in SPring-8. In order to expand an additional accelerator/beam-transport area efficiently in the future, the functional independence of each accelerator/beam-transport area has to be well established on the safety interlock system. Therefore, the design of a new accelerator safety interlock system has been discussed to satisfy the independence and migration methodology from the current system to the new one. The construction of the new accelerator safety interlock system will be finalized in September 2010. And the new accelerator safety interlock system will be ready for the user operation by the end of September 2010. We will report the design of the new accelerator safety interlock system and the process of the system construction.

O - 46

Continuity of Accelerator Operations during an Extended Pandemic

Noel Okay

The Operations group for the Continuous Electron Accelerator Facility in Newport News Virginia has developed a Continuity of Operations plan for pandemic conditions when high absenteeism may impact accelerator control room operations.
Protocols to address both the potential spread of illnesses in the control room environment as well as maintaining minimum staffing requirements for contiguous accelerator operation will be presented. During acute pandemic conditions local government restrictions may prevent continued operations but during extended periods of high absenteeism accelerator operations can continue when some added precautionary measures and staffing adjustments are made in the way business is done.

Keywords: continuity accelerator operations pandemic

O - 47

DESY Access Control System

M. Bieler

At DESY access to all accelerators is handled through an access control system. At every door there is a terminal to read RF-ID-cards. The terminal holds a copy of a central data base, where the access rights of all card holders are stored. This talk describes the main features of the access control system and its interface to the personnel interlock system.

O - 48

Implementation of Electrical Safety Procedures and Techniques for Accelerator Operations

Martin Murphy

Over the last several years Fermilab has strongly adopted NFPA 70E, which is the standard that defines electrical safety requirements for employees as set out by the National Fire Protection Association. The standards are broadly written and far reaching. As Electrical Safety Czar for the Accelerator Operations Department I was charged with interpreting and implementing these guidelines for the department. A significant change in culture was required and through strong departmental leadership was achieved in short order. My presentation will briefly document the fundamental rule changes and how they were applied within the department. Additionally I willl describe how we will continued to improve other aspects of electrical safety.

O - 49

Reliably Cooling Accelerators

Don McGilvery, Graham Harding, Robbie Clarken

Maintaining optimal cooling water flow is critical for the safe operation and longevity of many accelerator components. Regular testing of all flow meters and switches is essential to ensure correct operation and calibration. The Australian Synchrotron has over 250 flow meters and a similar number of flow switches most of which are interlocked to Equipment Protection Systems. In the past testing has principally relied on ensuring that flows dropped to zero and protection systems were activated when the circulation pumps were shut off. However many meters have significant 밴n tolerance?zero errors and the actual trip point of the switches has not been tested.

Since we have control of the system differential pressure and hence flow, via variable speed drives on the pumps we can ramp down the flow and determine many parameters.
The automation of the test procedure, limitations and faults uncovered will be discussed.

The choice and problems associated with various types of flow meters and switches together with our experiences in the difficulties in the control of Low Conductivity Water parameters will also be discussed.

O - 50

Study of an Electrical Noise from Synchrotron Radiation

Y. Ishizawa, T.Ohata

In the meeting, I will show some tools and measurement methods that makes easy to study an electrical noise at the Beamline.

Since 2003, a log of uncertain trouble was reported on the motion control system in SPring-8 Beamline.

A stepping motor is used as a standard motion control system. Some motors moved away without instruction and motor controllers are sometimes broken.

We conducted nondestructive environmental measurement of electric noise with the condition of actual equipment in the user time.

Then, a high intensity electrical noise that has enough energy to move a stepping motor was found.

We installed various kind of ferritic core to the motor control line and studied effects on the control system.

Finally, the electric noise problem could be solved by installing ferritic core corresponding to the frequency response.

O - 51

Preparation for Beam Commissioning at the LHC

Rossano Giachino

LHC commissioning with beam started in the third quarter of 2008 and again in late 2009. On both occasions, first circulating beam was preceded by a major campaign of equipment tests. These included extensive powering of the ~2000 superconducting electrical circuits, so-called Dry Runs of all major accelerator system, injection tests into parts of the machine and finally a full machine checkout. These tests, extending over many months, proved to be essential and undoubtedly made a major contribution to the rapid and successful start to beam commissioning.

O - 52

Preliminary Measurement of Be-10 Isotope by 1 MV AMS

Wan Hong, Jung Hun Park, Ki Suck Sung, Gyujun Park

Generally, Be-10, has been measured by an AMS with the terminal voltage higher than 3 MV. Recently, it is challenged to measure the rare isotope using small AMS system. 1 MV AMS system in KIGAM has been tried to measure not only Be-10 but also Al-26 isotopes. Since B-10 makes very severe interference on the Be-10 measurement, it is a key point to separate Be-10 peak from B-10 peak. Absorber foil is adopted to separate B-10 and Be-10 by the small mass difference between these two isotopes. However, foil makes large beam dispersion and count rate at a detector after the foil decreases. Determination of detection efficiency, which is the ratio between the number of ions in a target and the number of detected ions at detector, is important to quantify the Be-10 isotope. Several known standard samples with different Be-10 contents were prepared and measured to make efficiency calibration curve. Foil was very efficient to separate the peaks and the linearity of the correlation between Be-10 contents and count at the detection was good.

O - 53

Development of the Operation Tools for the 2009 KSTAR Experiment

Sulhee Baek, Sangil Lee, Woongryol Lee, and Mikyung Park
National Fusion Research Institute, 113 Gwahangno, Yusung-gu, Daejeon, 305-333, KOREA

From August to December in 2009, the operators operated 30 machines for the Korea Superconducting Tokamak Advanced Research (KSTAR) experiment. During the period, 10 among the primary 18 machines were operated continuously to keep the required vacuum pressure and the superconductivity of the tokamak. 2 heating devices and 10 diagnostic devices were operated for the plasma experiments which were proposed by international participants. To integrate heterogeneous systems, we have chosen the Experimental Physics and Industrial Control System (EPICS) as the middleware of the KSTAR control system and developed various operation tools based on the EPICS Channel Access (CA) protocol to assist operators. Most operator interfaces were developed using the KSTAR Widget Toolkit (KWT) which was a widget toolkit to develop Qt application for the EPICS-based control system and others were developed using the EPICS extensions. StripTool or Multiplot application were used to monitor run-time operation data and ArchiveViewer was used to retrieve the archived data. The data acquired during the plasma experiment was archived using MDSPlus and jScope was used to retrieve the experimental data. To encourage participants' recording on the experiment, the DIII-D logbook was introduced and adjusted for the KSTAR experiment.

P - 01

The Improvement of HIMAC-INJECTOR Operation

H.Izumiya, I.kobayashi, Y. Kageyama, C. Kobayashi,
W. Takasugi, M. Yamamoto, T. Takeuti, T. Sasanoa,
E. Takada, Y. Iwata, M. Muramatsu

HIMAC of NIRS is the world's first medically-dedicated heavy ion accelerator. We started treatment in 1994, and 5,196 patients were registered and treated. (as of February 10, 2010)

One of the most important subjects of our work in HIMAC is the stabilization of the machine condition with doing beam supply continuously for 24 hours. Therefore, the improvement in software and hardware and increase in efficiency of the machine have been pursued at HIMAC-injector in the limited maintenance time.

Therefore the number of operators per shift was reduced, and we use the time of that share as a maintenance time of the improvement (and remodeling) for the performance enhancement of the machine.

Easier device operation improves the reliability of the beam supply. We apply an ECR ion source as a device only for the Carbon suppl y, therefore we can operate an ECR ion source simply. And, in addition, the redundancy of the machine is needed for the reliability of the beam supply.

For instance, the introduction of compact injector which can be used for backup system is proceeding. The compact injector needs less amounts of consumption of the electric power in comparison with present HIMAC-injector.

We report the present status of HIMAC-injector in this time, also from view of the trouble shooting, machine check, and so on. (the start and adjustment of the device before the beam supply, on biweekly Monday. introduction of PLC, and electric discharge in the tank of RFQ are among topics)

P - 02

Operation of Cyclotrons at RCNP

T. Yorita, K. Hatanaka, M. Fukuda, T. Saito, H. Tamura,
M. Kibayashi, K. Nagayama, A. Tamii , S. Morinobu

Research Center for Nuclear Physics (RCNP) of Osaka University has the accelerator complex consists of an AVF cyclotron (K=140) and a ring cyclotron (K=400). It provides ultra-high quality beams as well as moderately high intensity beams for a wide range of researches in nuclear physics, fundamental physics, applications and interdisciplinary fields. Maximum energy of protons and heavy ions are 400 and 100A MeV, respectively. The available beam time for experiments was 5079h for Light ions(p-4He) and 1017h for Heavy ions(6Li-) in 2008. The detail review of operation of the cyclotrons will be presented.

P - 03

Current State of HIMAC Accelerator

M. Kawashima, Y. Honda, I. Kobayashi, M. Yamamoto,
Y. Kageyama, K. Ichinohe, H.Fujiwara, E.takada, Y.Iwata, S.Sato

HIMAC treated the cancer of various parts from June, 1994 up to the present time?and the number of registered patients exceeded 5,000 recently. HIMAC supplies beam to the biological and the physical research during nighttime and holiday, while patients are treated during daytime of weekdays. Typical annual hours of operation amount to 5,700hours. 2300hours are for experiments of physics and biology. Treatment beams correspond to 40 weeks/year.

Many species of ion are requested from experimental users, and the result of available beams will be given. The improvements of beam for more effective to cancer and for more friendly to patients have been pursued: respiratory gating, increase of beam intensity etc. Treatment beam is also refind in terms of efficiency and stability etc with systematic study. Further more reparation for new treatment facility is under way.

As for the beam down time due to the trouble of the accelerator, it is about 50 hours in this fiscal year, more than 25% increase from the previous year. We discuss an analysis and outlook on the problem.

One of the concern is discontinuation of service & supply of elemental devices. Review of replacement and maintenance policy will be reported.

P - 04

Injector Linac Upgrade and Operation for the BEPCII Project

Guanghui Chen for the BEPCII-Linac Group

BEPCII is an upgrade project of Beijing Electron Positron Collider . It was officially approved by the government in 2001. Linac is not only requires injector to have a higher beam energy (1.89 GeV) for high energy physics injection and Synchrotron radiation (2.5GeV), but also a higher beam current. Thus the original BEPC injector linac must be upgraded.The linac operation is stable and reliable. It has been put into the beam commissioning for approximate six years.

P - 05

Design Concept of the Modulator System with Inverter Power Supply for 3.0 GeV Linac

S.H. Kim, S.S. Park, J.D. Park, K.R. Kim, S.H. Nam

The 200 MW pulse modulator system has been working at Linac in PAL (Pohang Accelerator Laboratory) since 1994. The existing beam energy is 2.5 GeV. 12 sets of the modulator system work at Linac to get the energy of 2.5 GeV. We need two sets of the modulator system to get the energy of 3.0 GeV in the PLS II. The current modulator system at Linac is called a “Line Type Modulator” since it uses a capacitance-inductance network (pulse forming network). The new type of the modulator installed in the gallery of Linac will be employed as an “Inverter Type Modulator” to reduce its size. The specifications of the modulator system are 400 kV, 500 A, 7.5 μ, 30 Hz. Design concept of the new type of the modulator system will be presented.

P - 06

The Monte Carlo Simulation for a Measurement of a Neutron Cross Section in the Pohang Neutron Facility

Sung-chul YANG

It is essential that neutron cross sections are measured precisely for many areas of research and technique. In Korea, these experiments have been performed in the Pohang Neutron Facility (PNF) with the pulsed neutron facility based on the 60 MeV electron linear accelerator.

The TOF measurement for neutron total cross section of the 'W' target was simulated by using MCNP 2.5.f code and the characteristics of photo-neutrons produced from this target system and the results are verified against to the experimental values.

P - 07

The Operation Scenario of Beam Lines and Target Room in the PEFP Accelerator Facility

Sang-pil Yoon, Bum-sik Park, Yong-sub Cho

The Proton Engineering Frontier Project(PEFP) has planned to construct 100 MeV proton Linear accelerator and to supply 20-MeV or 100-MeV proton beam to users. To meet user's demand, the PEFP will construct ten beam lines and ten target rooms,each of which gas its own characteristic purpose.

On behalf of many beam lines and target room of PEFP accelerator complex, it is required to distribute the limited beam time efficiently to satisfy many user's demand. thus, We have prepared the operating scenario of accelerator operation.

In this paper, the present status and beam the beam quality assurrance plan of target room will be presented also.

* This work is supported by the Ministry of Education, Science and Technology of the Korean government.

P - 08

Operation Scenario of the Vacuum System in PEFP Accelerator and Beamline

Hwa-Ryun Lee, Yong-Sub Cho, Hyeok-Jung Kwon,
Han-Sung Kim, Bum-Sik Park

The Proton Engineering Frontier Project(PEFP) is developing a 100MeV, 20mA linear accelerator. The vacuum system of 20MeV accelerator was installed and has been operating at Korea Atomic Energy Research Institute(KAERI) site. This system consists of a ion source part, Radio Frequency Quadrupole(RFQ) part and Drift Tube Linac(DTL)1 part. In these parts of the vacuum system, the main pump are a Turbo Molecular Pump(TMP) at RFQ and an ion pump at DTL1.

The normal operation condition is E-7 torr in the range. To operate a 100MeV vacuum system we were designed the pumping system for DTL2. As a same strategy the beamline vacuum system also has to be prepared. Thus, we have planned to the operation scenario of the overall vacuum system. In this paper, the improvement and design of the PEFP vacuum system will be presented and discussed.

* This work is supported by the Ministry of Education, Science and Technology of Korea.

P - 09

DEVELOPMENT OF HIGH RESOLUTION LARGE DISPLAY FOR SPRING-8 CENTRAL CONTROL ROOM

T. Hamano, R. Fujihara, A. Yamashita

We developed a large size high resolution display wall for SPring-8 central control room. A PC-cluster consists of seven personal computers interconnected by Ethernet drives twelve 40-inch(1366 x 768pixel) LCD displays. Those displays are arranged into 6x2 segment to achieve 12 million pixels(8196 x 1536pixel) resolution. A software Rocks* handles twelve displays as one X-Window server. We built a prototype model in prior implementation of the display wall. The prototype model is formed of twenty four 20.1-inch LCD displays arranged into 8x3 segment to achieved 46 million pixels(12800 x 3600pixel) resolution. We examined software
configuration and performance on the prototype before the instllation. This paper describes construction, configuration and testing of the high resolution display wall.

P - 10

Control Status of the PLS MPS Control System

J. C. Yoon, J.W. Lee, S.J. Park and K.R. Kim

The control system architecture provides easy access to the equipment in a reliable and efficient way. It facilitates the development and maintenance of distributed applications, and the implementation of the required control schemes. The power supply control system was consist of the VME based IOC and the Embedded IOC based IOC. The VME system of the PLS was used for the Bipolar power supply control system. The control method is the high speed control method by using the photo module of which performance and stability are proven in the PLS. 12 sets of VME IOC was installed in the storage ring for the system configuration. The Embedded IOCs will be used for the Unipolar power supply control system. In the case of Unipolar power supply, the number of quadrupole power supply will be increased from that of the PLS and PLS-II. The Embedded IOC is connected to the power supplies by a power supply multi serial converters. This Embedded IOC is equipped with MODBUS TCP/IP Ethernet interface as well as 100Mps Ethernet. It is designed to be modular and scalable in order to accommodate future changes and expansions.

P - 11

The Control Room FERMI

Andrea Apollonio

How is made the control room of the laser with the lowest length wave?
This poster illustrates the successful implementation and the reasons that led to the construction of the control room FERMI, for example the choice of the lighting, working with 4 monitors 2x2 combined, the instrumentation, the type of software used for workstations etc.

P - 12

HIMAC Irradiation System Operation, Maintenance and Troubleshooting

K.Shimabukuro,T.Uno,Y.Tachikawa,S.Minohara,S.Fukuda,E.Takada

We report on the operation, maintenance and troubleshooting of patient irradiation system at the Heavy Ion Medical Accelerator in Chiba (HIMAC). Clinical trial using carbon beam was started in 1994, and now more than 700 patients with cancer are treated annually. In 2003, carbon-ion radiotherapy at HIMAC was authorized as “Highly Advanced Medical Technology” by the Health Ministry of Japan. As a result, the recognition level of the particle radiotherapy in Japan rises, and demand will increase in the future.

As the facility for particle radiotherapy is large complex systems, the operation of patient irradiation system is as crucial as that of accelerator system to keep the stable and reliable patient treatment. Operators who have knowledge of accelerator devices and irradiation controllers are indispensable to support medical staffs smoothly in treatment procedure. One of our works is to support the daily dosimetry for the quality assurance. We reports on them:

?PERIODIC PROCEDURE

?PATIENTS-SPECIFIC PROCEDUR

The beam for treatment must be supplied on schedule in a limited time window. To keep the daily treatment schedule, we should prevent trouble as much as possible and solve occurred problem as soon as possible. Preventive maintenance activity consists of daily checkup, weekly and semiannual maintenance. Overview of the activity is introduced.

In addition, we utilize the data base of troubleshooting. The process from trouble occurrence to solution is recorded by operators. The data

base can be retrieved in case of trouble, which shows similar one occurred in the past. The trouble includes operational mistake and these data are used for the analysis of human error. Suggestions and requirements from medical staffs are also recorded for future improvements.

As a result of these activities, therapists can concentrate on treatment, and can do high-quality treatment.

P - 13

User Interface Design for PEFP Accelerator Operations

Eun-Mi An, Young-Gi Song, Hyeok-Jung Kwon, Yong-Sub Cho

The PEFP(Proton Engineering Frontier Project) 100-MeV linac user interface system is being developed. The main tasks of the PEFP accelerator control are safety management for error-warning system, data storage and data display for monitoring and controlling data. The control system should supply display functions to the operators such as graphical and user-friendly form. In order to provide an easy-to-use interface for operators, the graphical user interface was successfully designed and completed. In this paper will introduce the PEFP user interface. As a new work, we are developing the application tools to accommodate user interface extension for data management.

* This work is supported by the Ministry of Education, Science and Technology of the Korean government.

P - 14

Estimations of the Induced Activities in the Proton Accelerator Facilty of PEFP

Cheol Woo LEE, Young-Ouk LEE, Sung Chul YANG

In Korea, the Proton Engineering Frontier Project (PEFP) is building a proton linear accelerator facility with the energy up to 100 MeV and a beam current of 20 mA. In this study, induced activities after shutdown in the accelerator facility of the PEFP were evaluated by using a Mote Carlo method. Five categories were considered for the evaluations of the induced activities.

In this Study, the air activation in the facility, induced activities from the structure materials (concrete walls, lead shields and polyethylene block) and activation in the soil around of the facility were estimated. Also, migration of the radio-nuclides from activated soil to the ground water was estimated to evaluate radiological impact on environment.

P - 15

Beam Energy Reliability by the Cooling Water Temperature of the PLS

Mun Gyung Kim

Pohang Light Source(PLS) has a plan for top-up mode operation. The top-up mode operation requires more reliability of the beam energy injected to the storage ring. And PLS linac is a full energy injector with energy doubler system(SLED). The most important factor of the energy gain by the SLED is cooling water temperature. So PLS has improved the reliability of cooling water control system. This paper presents improved reliability of the injector beam energy by the new cooling control system.

P - 16

An Automated Injection System for "Fill on Fill" Operation

J. Trewhella, D. McGilvery, M. ten Have

The injection system for the Australian Synchrotron consists of a 100MeV Linac and full energy (3GeV) booster and requires the control of several hundred parameters to obtain good injection efficiency and minimise radiation. Previous machine procedures required operators to manually tune systems, and follow rigorous start up and shut down procedures. As a result, there were a number of beam loss events through failure to follow procedures and the efficiencies obtained varied significantly between operators.

An almost fully automated software layer, integrated with the EPICS control system, has been developed which optimises the sequence and timing of each individual sub system; virtually eliminating operator error, maintaining consistently high efficiency, minimizing the run time of critical systems, reducing radiation levels and saving energy. It has also significantly reduced total injection time and stress levels for the operators. This system will be discussed, and will also include reviews of further benefits of semi-automated recovery after unscheduled beam loss events and progression to "top-up" mode of operation.

P - 17

Commissioning of the Carbon Beam Gantry at the Heidelberg Ion Therapy (HIT) Accelerator

M. Galonska, S. Scheloske, R. Cee, A. Gaffron, K. H?pner, C.M. Kleffner, A. Peters, T. Haberer

The Heidelberg Ion Therapy Facility (HIT) is the first dedicated proton and carbon cancer therapy facility in Europe. It uses full 3D intensity controlled raster scanning as treatment technique. The ion energy ranges from about 50 up to 430 MeV/u corresponding to ion penetration depths of 20 to 300 mm. The ion beam can be transported along four beam lines. The first two beam lines transport the ion beam to horizontal patient treatment rooms. The therapy in the first room started successfully in November 2009, while in the second room the treatment equipment is getting prepared for patient treatment. A third horizontal target station is built for quality assurance, development, and research.

The HIT facility comprises the only carbon ion gantry worldwide designed for the beam transport of carbon ions up to an energy of 430 MeV/u corresponding to a magnetic rigidity of 6.6 Tm. The gantry rotating angle of 360 degrees enables patient treatment from arbitrary directions. While the first proton and carbon beam was transported to the isocenter in January 2008, the commissioning has been stopped since March 2008 due to cabling problems in the flexible cable tray. After some modification of the cabling the commissioning process now re-started. The commissioning aims for an efficient way of setting the beam optics in order to realize the full set of beam characteristics, i.e. 2 ion types, 255 energy steps, 4 beam widths and 10 intensities, all independent of the gantry angle. This paper gives a brief outline on the commissioning activities so far.

P - 18

Improvement of MC-50 Cyclotron Tuning Module through Development of Software Program for Cyclotron Control Console System

Yeun-Soo Park, Sung-Jin Cho, Min-Yong Lee, Won-Taek Hwang, Tae-Keun Yang

The MC-50 Cyclotron is the first accelerator in Korea which can accelerate various particles like proton, deuteron, He-4, and He-3. It can accelerate up to 50MeV energy in case of proton. At first, MC-50 had been introduced in the middle of 1980s for neutron therapy and radioisotopes production exclusively. However the range of MC-50 utility has been extended to the radioisotopes development, cyclotron application researches using ion beam and fast neutron irradiation. Now MC-50 is being employed in many fields except neutron therapy.

The control system of MC-50 is composed of PDP-11/23 Plus main computer, cyclotron control console which is kind of terminal, and I/O system. Especially, cyclotron control console plays a key role in the beam tuning by controlling all of the parameters of accelerator. Cyclotron control console consists of complex two hardware sections. One is TUM(Tuning Module) controller, the other is displays and encoders. TUM controller system comprises various electronic control boards like Metric CPU-S which contains dedicated Z80 microprocessor, PIO, connector board, etc. Displays and encoders are used for display the current parameter values and adjustment the parameter values respectively, which are finally controlled by the Z80 microprocessor of Metric CPU-S board.

In order to tune the ion beam at MC-50, communication control should be basically performed between cyclotron control console and PDP-11/23 Plus through RS232 serial. However, the RS232

communication was not worked properly because an important EPROM including TUM program code was broken down by a stupid mistake during I/O system repair. Unfortunately there was not any spares to replace it, and also it was impossible to seek an identical TUM program code because original company made it had been already bankrupted long ago.

There was no any other methods to run MC-50 cyclotron again except directly development of new cyclotron control console system. So we developed it which is operated by completely software program using LabVIEW graphical language. To begin with, we thoroughly analyzed all of the related protocols referring to the poor manual to eliminate even simple errors, and repeated trial and error to complete it. Therefore there will be no more hardware troubles because there are no hardware parts in the newly developed cyclotron control console system. And it is expected that there will be almost no more software troubles as well because of the in-depth programming according to the original function of the cyclotron control console system.

The 7th International Workshop on Accelerator Operations