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NTPC Limited
(A Govt. of India Enterprise)

केन्द्रीय कार्यालय/Corporate Centre

DO 01:CIGRE:2011
October 15, 2011

Shri V.K.Kanjlia
Secretary
Central Board of Irrigation & Power
Malcha Marg
Chankya Puri
New Delhi-110021

Dear Shri Kanjlia,

Please find the Report of the Study Committee Meeting of CIGRE SC A3 "High Voltage Equipment". I am also enclosing the Minutes of the Meeting of CIGRE Study Committee A3 held at Vienna, Austria on 9th September, 2011.

With kind regards,

Yours sincerely,

[N.N. MISRA]

REPORT OF STUDY COMMITTEE MEETING
CIGRE SC A3 "HIGH VOLTAGE EQUIPMENT"
VIENNA, AUSTRIA, FRIDAY, SEPTEMBER 9, 2011

CHAIRMAN	-	MARK A WALDRON (U.K.)
SECRETARY	-	EDELHARD KYNAST (GERMANY)
MEMBERS	-	LIST AS PER ANNEXURE

The meeting started with the Chairman welcoming all the members. He sought approval of the Agenda for the days meeting from the members and confirmation of the minutes of the last SC A3 meeting held in Paris in August, 2010. The same was approved without any comments. The Strategic Plan for A3 draft of which was circulated was discussed. He requested comments from the members within 4 weeks time so that the same can be finalized. The Chairman announced that he will be completing his term by August, 2012 and the new Chairman selected by CIGRE, Paris is Mr. Ito Hiroki from Japan. He is the first Chairman from Japan, and is also first from Asia to be Chairman of any Study Committee of CIGRE.

The status of the various Working Groups were presented by the Convenors.

1) A3.21 Application of Non-Ceramic Insulators

No Indian representative in this group. This group has completed their work and the group has been disbanded.

- 2) A3.22 UHV Equipment
- Indian representatives were Mr.M.C.Bhatnagar (PGCIL), Mr.Subodh Kale (CGL), Mr. John Yesuraj (CGL). This group has completed their work and the group has been disbanded.
- 3) A3.15 Non-Conventional Instrument Transformers
- No Indian representative in this group. Since the convenor has not been responding, a new convenor has been identified. The list of members will also be updated. Since the draft is ready, the same will be reviewed and finalized. The timelines will be drawn up by the new Convenor.
- 4) A3.17 Surge Arrestors
- No Indian representative in this group.
 - The report will be finalized by September, 2011.
 - The group is likely to complete the work and disbanded by August,2012.
- 5) A3.06 Reliability of HV Equipment
- Indian representative is Mr. J. Patel (CGL).
 - They have nearly completed the 800 page document. The same will be circulated to all SC Members in September, 2011 and comments solicited in a months time. After receipt of the comments, the same is expected to be finalized and submitted to Central Office, Paris in November, 2011 and the group will be disbanded by the end of the year.
- 6) A3.23 Guidelines and Selection of FCL
- No Indian representative.
 - The final draft is expected to be ready by end of 2011.
 - The final WG Meeting is likely to be held in March, 2012.

- After completion of the balance formalities, the group is likely to be disbanded by August, 2012.
- 7) A3.24 Simulating Internal Arcs and Current Withstand Testing
- No Indian representative.
 - This WG was formed in March, 2009 and had its first meeting in March, 2009. The 7th Meeting will be held in Vienna on 12th & 13th September, 2009.
 - Final report is expected by August, 2012.
- 8) A3.25 MO Varistors and Surge Arrestors for Emerging System Conditions
- No Indian representative. This group was formed in March, 2009.
 - This WG had its 6th meeting in Vienna on 6.9.2011.
 - The next meeting is scheduled in Stockholm in April, 2012 and Paris in August, 2012.
 - The report is expected to be finalized by end 2012.
- 9) A3.26 Influence of Shunt Capacitors on Circuit Breaker Fault Interruption Duties
- Indian representative is Shri A.P. Gangadharan (PGCIL).
 - The next meeting of this group is scheduled in Berlin in November, 2011.
 - The group was formed in 2009 and is expected to produce the final draft by March, 2012 and finalize the report by the end of 2012.
- 10) A3.27 Vacuum Switchgear at Transmission Voltages
- Indian representative is Shri S.P. Hambarde (NTPC) and Shri S.Kulkarni (CGL).
 - This group was formed in 2009 and will have its 5th meeting in Pittsburgh, USA in October, 2011.
 - The draft is expected to be finalized by end of 2012.

- 11) A3.28 Switching Phenomena and testing requirements for UHV & EHV Equipment
- This group was formed in August, 2010.
 - There is some confusion about Indian representative in this group. It was requested to limit Indian representatives to 4 members. The same will be sorted out by CIGRE India and intimated to the Convenor of the WG and the Chairman & Secretary of SC A3. (Proposed is one representative from PGIL , one from NTPC, one from CGL and one from Areva).
 - The draft is likely to be prepared by the end of 2012.
- 12) A3.29 Deterioration of Ageing Substation Equipment and possible mitigation techniques
- This group was formed in August, 2010.
 - The Indian representative is Shri H. Gupta (NTPC).
 - The 1st meeting was held in Prague in March, 2011 and the 2nd meeting in Vienna on 5th Sept., 2011. It is proposed to hold the next meeting in India in February, 2012. Indian representative in consultation with CIGRE India to confirm the same to the Convenor.
 - The draft is expected to be prepared by March, 2014 and finalized by July, 2014.
- 13) A3.30 Impact of Over Stressing of Substation Equipment
- This group was formed in August, 2010.
 - The Indian representative is Mr.R.K. Sarkar (PGCIL)
 - This group had its first meeting in Vienna on 5.9.2011.
 - This group has all members from utilities and one representative from manufacturer.

- The next meeting is scheduled in March, 2012 and the timeline will be finalized then.

14) A3.31 NCIT with Digital Output

This is a new working group finalized by the Technical Committee. A request was made to nominate members for this group.

General

1. A presentation was made about the activities of CIRED which is mainly dealing in distribution area.
2. A presentation was made by a representative of SC B3 – "Substations" indicating their activities so that overlap areas are identified with SC A3.
3. Current Zero Club – no further information was available since no meeting has been held recently.
4. US involvement in SC A3 was presented. This showed a significant improvement making US the largest contributor in A3 with more than 250 experts involved in various WGs and SCs.
5. The close interaction between IEC and CIGRE was also presented highlighting the areas of internal benefit.
6. Suggestions were solicited to identify new areas requiring formation of WGs.
7. The tentative schedule for Paris 2012 was indicated as follows –
 - A3 session will be on Wednesday (29.8.2012)
 - Poster Session will be on Thursday (30.8.2012)
 - A3 SC meeting will be on Friday (31.8.2012)

About 23 to 25 papers have been selected in A3 session and the final list is likely to be announced in a weeks time.

8. The SC meeting of A3 for 2013 is proposed to be held either in Australia or China. The same will be finalized shortly.

N.N. Misra
15/10/11

N.N. Misra
Indian Representative in SC-A3

Encl: Minutes issued by Secretary – SC A3

**Minutes of SC A3 Meeting,
September 9th, 2011, Vienna, Austria**

1 Welcome

The Chairman Mark Waldron welcomed all Members, Conveners, Representatives and Guests to the meeting of CIGRE Study Committee A3 in Vienna. For the participations and apologies see the list of participants.

2 Approval of agenda

The Draft Agenda was approved with the addition of information concerning the IEEE activities in the field of UHV after the topic report of WG A3.28 and some information concerning the US NC and IEC SB1 under topic 10.

3 Approval of minutes of last meeting of SC A3, 2010

The minutes of the last SC meeting 2010 in Paris were approved without any changes.

4 Membership

There were no changes during the last year in SC membership.

5 CIGRE Technical Committee Report

Some important issues from the Technical Committee discussions were reported by the Chairman:

- o The next chairmanship of SC A3 will be taken over by Hiroki Ito.
(later in the meeting it was stated by Ito, that he is surprised and happy about this first Japanese Chairmanship. The task of Secretary will be carried on by Kynast)
- o A new set of promotion material is available from CO, e.g. a new master slide for promotion, which can be used for presenting of Cigre everywhere.
- o The renewal of the Cigre website is under discussion.
- o Cigre is going to write its own history and the first part is almost ready for publication.
- o To get a best practice for WG Conveners proposals will be circulated by CO, based on the work of SC B2.
- o A possibility to publish scientific papers in Electra exists and a review team has been established by CO. Contributions are encouraged. A suggestion from the floor was to start a trial with a paper from WG A3.06.
- o Annual reports will be introduced again in Electra once a year from each SC.
- o Poster Sessions for the Cigre-week in Paris will be started for all SCs. More detailed information will be given after the discussion during the next TC meeting.
- o Following a legal challenge to a Cigre publication, it is more important than ever that Cigre focuses upon scientific & factual information and avoids any unsubstantiated opinions.

6 Strategic plan, action plan

A draft of the SC A3 Strategic Plan was circulated just before the meeting. Regarding previous discussions and comments it was written by Franz Heil to be in line with the technical directions of Cigre. Since this draft is reasonably mature all are asked for a final feedback within the next four weeks (6 pages only to read).

all

The SC A3 Action plan will be revised after this meeting.

7 SC A3 web page – news, comments

The Secretary explained shortly the access to the members' area. The next update will be done with the results and minutes of this meeting; including an update respectively the new version of Action and Strategic Plan.

Secretary

8 Report of Working Groups

For further information see also the Activity Reports presented by the Conveners or substitutes in the meeting.

All presented new WG Members were approved by the SC.

8.1 WG A3.21 Application of non-ceramic insulators

WG A3.21 was disbanded with many thanks to Convener DeNigris and WG members. All work was completed last year and the Technical Brochure was published in April 2011:

- TB 455 Aspects for the Application of composite insulators to high voltage apparatus; WG A3.21_04-2011

8.2 WG A3.22 UHV Equipment

WG A3.22 was disbanded with many thanks to Convener Hiroki Ito and WG members. Two Technical Brochures have been published, especially to support the IEC standardization work in the UHV range:

- TB 362 Technical requirements for substation equipments exceeding 800 kV; WG A3.22_12-2008
- TB 456 Background of technical specifications of substation equipment exceeding 800 kV; WG A3.22_04-2011

Furthermore several papers have been published in the name of WG A3.22 (see Activity Report of the follow up WG A3.28).

8.3 WG A3.15 Non Conventional Instrument Transformers

A final draft TB was sent in the beginning of 2010. The Electra paper is still pending. Because no contact could be made to the Convener (Tantin) the Chairman suggested to handover the finalization of the nearly read TB and the writing of a summary for Electra to Farnoosh Rahmatian, a member of the WG. Since there were no objections from the floor the Chairman will ask Rahmatian. Hubert Mercure offered his support to the finalization of the WG A3.15 work.

Chairman

8.4 WG A3.17 Surge Arresters

The situation was explained by Convener Richter: The Electra-summary is ready meanwhile and the TB will be finalized until the end of September.

The drafts will be circulated for comments immediately after finalization to get a feedback as fast as possible.

8.5 WG A3.06 Reliability of HV equipment

The work of WG A3.06 is nearly finished. The large amount of data and results will be divided and published in 6 TBs. The first part with the description of the statistical

methods is still under consideration. All other parts and Electra-articles are finished. They will be sent to the Secretary for circulation within the SC as soon as possible. The Chairman emphasized the outstanding activity of the group over the long period with a lot of travelling, meetings and homework and thanks especially the Convener Sölver and his successor Runde. One focus during the revision for comments by the SC members should be to find out subjects for future activities. One hint was given already from the floor: The secondary circuits are not well covered in this work.

8.6 WG A3.23 Guidelines and selection of FLC

The final draft of TB was circulated some days before the meeting. Based on the comments it will be finalized within this year. With writing the Electra summary in the beginning of next year all work will have been done. Convener Schmitt explained, that the work describes the state of the art of FLCs and recommended no further activities.

8.7 WG A3.24 Simulating internal arcs and current withstand tests

Convener Uzelac explained some technical details of the activities. Due to the special topics some new members joined the WG. Aim of the WG is to finalize the work on the draft report until August 2012 for circulation within the SC.

8.8 WG A3.25 MO varistors and surge arresters for emerging system conditions

Richter presented the main subjects of the activities. Next year the TB will be prepared and end of 2012 the work will be finalized.

8.9 WG A3.26 Capacitor bank switching and impact on equipment

Yoshida, a member of the WG, reported according the Activity Report. The work is on a good way and it is expected that a first draft will be available after the meeting that will take place in spring 2012.

8.10 WG A3.27 Vacuum switchgear

Based on an international survey a detailed overview of HV VCB products is now finished. Analysis and first parts of a TB are under preparation. The draft TB is planned to be finalized late 2012.

8.11 WG A3.28 Switching and testing of UHV&EHV equipment

Ito presented in short the subjects of the three Task Forces. Due to the high interest further new members have announced their interest. Aim of the WG is to finalize the TB in 2012.

Supplement to UHV:

Ken Edwards (BPA) explained the rising up of IEEE standards concerning UHV-Subjects and generally the way of standardization in IEEE. State Grid, China proposed three Ito

topics for standardization of UHV in IEEE. A first meeting was in June, the next will be held in October.

He emphasized that the work of Cigre and IEC should be considered in the IEEE work and collaboration with WG members is needed. Ito agreed to assist. Ikeda, who is dealing with UHV in IEC SG2, offers to exchange matters with Edwards.

8.12 WG A3.29 Ageing of substation equipment

The kick-off meeting was held in March 2011. A revised title of the working group was proposed, "Management of Ageing HV substation equipment". To avoid any sensitivity with SC B3 over substation management the title "Deterioration & ageing of HV substation equipment" will be used.

Maheshwari presented the time line of planned work. Some further experts are needed especially equipment specialists from utilities and manufacturers for capacitors, reactors etc.

A close cooperation with A3.30 will be part of the work.

8.13 WG A3.30 Overstressing of substation equipment

Carvalho reported about the kick-off meeting in this Vienna week. The membership consist mainly out of experts from utilities. They discussed the aims of the WG and asked for to change the WG-title to "Managing overstressing of substation equipment". The word management will be deleted, as above, making the title simply "Overstressing of HV substation equipment".

Concerning the detailed presentation of working topics the Chairman emphasized that the work should stick to equipment because system related matters are covered by other SCs.

8.14 WG A3.31 NCIT with digital output

The Terms of Reference had been approved in July and CO started the call for experts. According the last message from Convener, Rahmatian, there are only five nominations up to the date of the meeting. Some more experts are very welcome and the SC members should look around for interested persons.

(Note of Secretary: An additional Call for Experts will be send around within the SC)

All

Secretary

9 Report of Advisory Groups

9.1 AG A3.01 Strategic Planning

For information the Chairman explained in short the tasks of AG A3.01 which meets once a year in between the SC meetings. The WG-Convenors, some ex-members and experts are active in this group to give advice to the Chairman concerning interesting subjects for future work.

9.2 AG A3.04 Tutorials

In the past Peelo managed all matters concerning tutorials. Now he draws back from this job and the question comes up whether this will be done in the future again by one person or in a group. In the discussion the Chairman and the SC tend to have a group

and Smeets, Runde and Glinkowski agreed to take over the task of managing the SC A3 tutorials. Inside the group it has to be found a system how it can run in the best way. The latest version of Peelo's tutorial list will be sent to them by the Secretary. The question concerning the copyright for the tutorial materials came up again. The Chairman will try to clarify this with the CO.

Secretary
Chairman

10 Information upon other Groups/Organizations

10.1 CIRED

Kirchesch gave some general information upon CIRED organization and work. The last CIRED Conference was held in June in Frankfurt with 1350 papers. Beside others topics similar to A3 subjects have been presented for voltage levels of energy distribution (see presentation).

10.2 Current Zero Club

Smeets gave in short some information about the SF6 and vacuum circle of the CZC. Last year there were no meetings. The next will be held in October in Montpellier.

10.3 Information upon SC B3 activities

Kopejtkova gave an overview upon the activities of SAC B3 "Substations" (see presentation).

10.4 US National Committee

Glinkowski informed about the NC activities in the field of SC A3 and gave some explanations concerning the possibilities of information exchange between A3 and the IEEE switchgear committee (see presentation).

10.5 IEC new advisory committee - ACTAD

Ikeda explained the organization and change from the former IEC SB1 (Sector Board 1) to ACTAD. ACTAD deals with all matters concerning electricity transmission and distribution which concern, or may potentially concern, more than one TC or SC. It recommends standardization activities and identifies technologies to be standardized (see presentation).

11 New working items to be discussed

In an open discussion some topics were gathered:

- Surge arresters were not covered in the reliability study; Reasons for this were discussed and the question came up whether it is possible to learn out of the process of the reliability study to take it over to surge arresters. Richter agreed to gather some items in this direction. Richter
- Special applications of surge arrester e.g. for capacitor banks; an IEC FDIS is on the way: No big work area!
- General lack of knowledge: It is a topic for the tutorials. Johnnerfeldt will gather what kind of questions may be of highest interest. Johnnerfeldt
- DC-circuit-breaker: An paper from Christian Frank of ETH was published in IEEE. He can be invited to give an overview at the next SC meeting for to have some guidance. Chairman

- Circuit breaker with gas mixture for low temperature application: No deep interest, because nowadays these applications are covered by standardized test procedures.
- Delayed current zero: A proposal from last year; it is more related to generator cb's, which may be a topic in combination with SC C4.

The following topics were just mentioned:

- Reactor and capacitor switching accompanied by mechanical failures
- Changing network conditions
- Impact of equipment on or out of Smart grids
- Safety of cb's: Following a general trend safety of cb's may be defined by quantities.

12 Future Events

12.1 Cigre Paris 2012

The list of selected papers will be send out by CO soon.

Preliminary dates:

A3 group discussion Wednesday, August 29

The team for the session will be as before (Waldron, Janssen, Giboulet, Kynast)

A3 poster session Thursday, August 30

The rules for poster sessions will be discussed on the next TC meeting in November

12.2 Options for 2013

The SC has a couple of options (e.g. combination with a Symposium in Australia or invitation to China); up to now there is nothing fixed.

13 Miscellaneous

Ito asked for the procedures to publish A3.28 results in IEEE or elsewhere. There were no objections from the SC but it has to be clarified with CO.

No further topics!

The Chairman thanked Wolfgang Widl and the colleagues of OEV for the possibility to have all the events in Vienna and for the perfect organization and hospitality.

Annexes

Annex A	SC A3 Members, Conveners, Representatives and Experts
Annex B	List of SC A3 documents
Annex C	List of Working Bodies
Annex D	Lists of WG-Members

Presentations in separate file A3-11 (SC) 10a IWD

For the presentations of SC A3 meeting see the separate file which includes the following:

07-00_SC A3 webpage
08-04_Activity Report WG-A317_2011
08-05_Activity Report WG-A306_2011
08-06_Activity Report WG-A323_2011
08-07_Activity-Report WG-A324_2011__reduced pictures
08-08_Activity Report WG-A325_2011
08-09_Activity Report WG A326_2011
08-10_Activity-Report WG A327_2011
08-11_Activity-Report WG-A328_2011(D)
08-12_Activity Report WG-A329_2011
08-13_Activity-Report WG-A330_2011_R1
10-01_Cired_Ki_09.09
10-03_SCB3 for SCA3 20010-11
10-04_USNC_A3_Report-Sept11
10-05_Ikeda_Introduction of IEC new advisory committee@CIGREA320110909

Annex A: SC A3 Members, Conveners, Representatives and Experts**SC A3 Member**

Ahmethodzic, Almir
 Falkingham, Leslie
 Fan, Jianbin
 Fernandez, Paulo Cesar
 Gauthier, Laurent
 Glinkowski, Mietek
 Heil, Franz
 Ito, Hiroki
 Johnnerfelt, Bengt
 Kim, Jung Bae
 Kunt, Jiri
 Lopez-Cormenzana, Manuel
 Maheshwari, Ankur
 Martins, Jorge Filipe
 Mercure, Hubert
 Misra, Narendra Nath
 Nicolini, Roberto
 Nkosi, Sphiwe
 Ohnstad, Trond Magne
 Samek, Slawomir
 Schmitt, Heino
 Smeets, René P.P.
 Stathopoulos, Ioannis A.
 Twomey, Colm

Bosnia-Herzegovina
 United Kingdom
 China
 Brazil
 France
 United States
 Switzerland
 Japan
 Sweden
 Korea
 Czech Republic
 Spain
 Australia
 Portugal
 Canada
 India
 Italy
 South Africa
 Norway
 Poland
 Germany
 The Netherlands
 Greece
 Ireland

The World Bank
 Vacuum Interrupters Limited
 State Grid Corporation of China
 Eletrobras
 Siemens T&D
 ABB INC.
 ABB Schweiz AG
 Mitsubishi Electric Corporation
 ABB AB / High Voltage Cables
 HYOSUNG Corporation
 CEPS a.s.
 RED ELECTRICA DE ESPANIA
 Western Power
 REN - Rede Eléctrica Nacional SA
 IREQ / Hydro Quebec
 NTPC Ltd.
 CESI SpA
 ESKOM
 Statnett SF
 Energoprojekt-Krakow SA
 Siemens AG, E T PS
 KEMA, Testing, Inspection & Certification
 National Technical University NTUA
 ESB International

SC A3 Observer

Azcarraga, Carlos
 Baran, Ileana
 Chareonsrikasem, Somchai
 Coa, Raidel
 Eskenazy, Lilian
 Gonzalez, Sardi Blas Nelson
 Heggi, Nahed Ahmed
 Ivanov, Valery P.
 Mohammed, A. Al-Muaili
 Mouloua, Ouafa
 Steensels, Marc
 Vizintin, Stane
 Widl, Wolfgang E.

Mexico
 Romania
 Thailand
 Venezuela
 Israel
 Argentina
 Egypt
 Russia
 Saudi Arabia
 Algeria
 Belgium
 Slovenia
 Austria

Inst. Investigaciones Elect. (IIE)
 University Politehnica of Bucharest
 Electricity Generating Authority of Thailand (EGAT)
 EDELCA-Electricacion del Caroni
 Israel Electric Corp. (IEC)
 EDENOR SA
 Electricity Holding Company, (EEHC)
 VEI
 Saudi Electricity Co.
 ELIA ENGINEERING
 Elektrotechnik Institut Milan Vidmar
 ZELISKO GmbH

WG A3 Convener

Bosma, Anne
 Carvalho, Antonio Carlos
 Ito, Hiroki
 Maheshwari, Ankur
 Rahmatian, Farnoosh
 Richter, Bernhard
 Runde, Magne
 Schmitt, Heino
 Smeets, René P.P.
 Tantin, Pascal
 Uzelac, Nenad

Sweden
 Brazil
 Japan
 Australia
 Canada
 Switzerland
 Norway
 Germany
 The Netherlands
 France
 USA

ABB AB, High Voltage Products
 ONS - Brazilien System Oponeton
 Mitsubishi Electric Corporation
 Western Power
 Quanta Technology
 ABB Switzerland Ltd.
 SINTEF Energy Research
 Siemens AG, E T PS
 KEMA, Testing, Inspection & Certification
 RTE/CNER-DP
 G&W Electric

Representatives/Experts

Dufournet, Denis
 Giboulet, André
 Janssen, Anton
 Kirchesch, Peter
 Kopejtkova, Dagmar

France
 France
 The Netherlands
 Deutschland
 Czech Republic

AREVA T&D
 Consultant
 Liander
 Alstom Grid
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