Cigré SC B3

Substations

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Presentation Summary

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Mission and Scope

➢ MISSION

To facilitate and promote the progress of engineering and the international exchange of information and knowledge in the field of substations. To add value to this information and knowledge by means of synthesizing state-of-the-art practices and developing recommendations.

➢ SCOPE

Responsible for the design, construction, maintenance and ongoing management of substations and for electrical installation in power stations excluding generators. Serves a broad range of target groups in the Electric Power Industry whose needs include the technical, economic, environmental and social aspects of this scope in varying degrees.

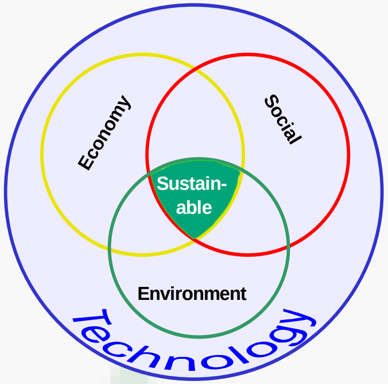
Major objectives include increased reliability and availability, asset management, environmental impact containment, and the adoption of appropriate technological advances in equipment and systems to achieve these objectives.

Target Groups

- Top management and executives
- Commercial group
- Technical group
- Operators
- Science, education and public group
- International organisations (IEC,IEEE,CIRED etc.)
- Cigré internal

Changes of the operational environment and their implications

- **Changes of the operational environment**
  - Environmental changes
  - Changing business environment
  - Increasing social awareness
  - New technological possibilities



- **Implications of the changing operational environment of SC B3:**
  - New principles for design and layouts of AIS and GIS
  - New substation concepts
  - Increased substation functionality
  - Increased secondary system functionality
  - New concepts for substation operation

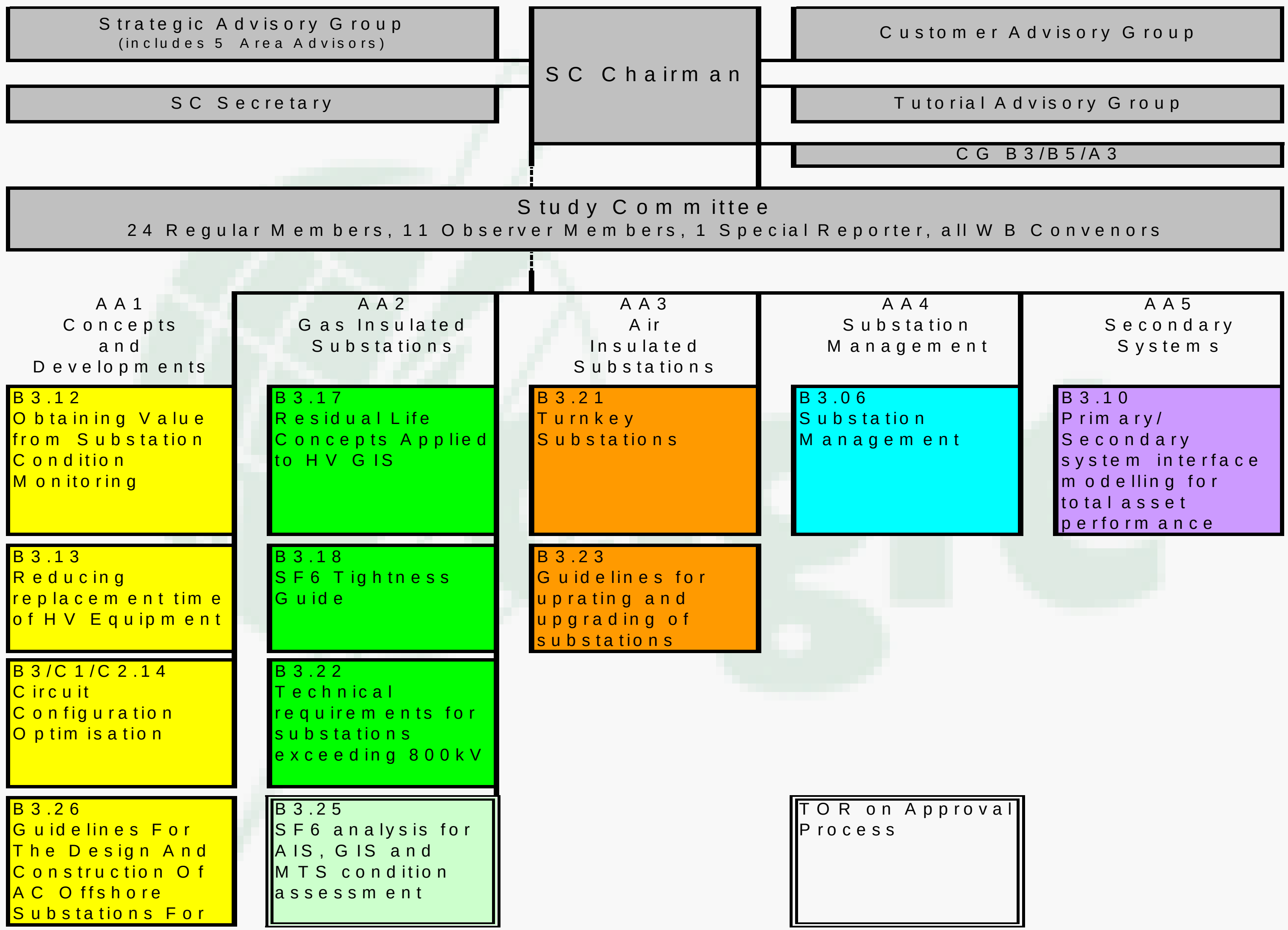
Strategic Directions

- **T1:** New substation concepts: Development of new concepts including novel bus arrangements, hybrid solutions, new applications and functions including specification of corresponding design/layout criteria for substations constituting integral parts of totally optimised networks
- **T2**: Environmental issues: Identification of development and trends in the physical, institutional and business environments, assessment of effects on substation requirements
- **T3**: Maintenance: Monitoring in-service experience including digital and sophisticated measuring equipment, GIS condition assessment, aspects of maintenance outsourcing, short-and long-term needs, opportunities for cost reduction, spare parts.
- **T4**: Life cycle management: Increased utilisation (life extension, upgrading, dynamic loading), refurbishment / renovation concepts, investment strategies, principles for combining existing and new equipment - taking into account specific demands from network-reliability and customer demand-side points of view.

Strategic Directions

- **T5:** Substation management issues: Organisational aspects including human resource and training needs, in-service support, software management including quality control and maintenance. Asset management including financial and technical aspects.
- **T6**: Strategies: Analysis of trends and development of strategies required to meet Target Group needs covering socio-economic, environmental and business aspects, strategic long term
- **T7**: Evolution of electrical equipment in power
- **T8**: Guides for users covering specification, installation, commissioning, operation, maintenance, life-cycle and ongoing management of substations and their subsystems.

Organisation



Advisory Areas

- **AA1 Concepts and Developments:**
  - SC B3.12: Obtaining value from substation condition monitoring
  - SC B3.13: Reducing replacement time of high voltage equipment
  - SC B3/C1/C2.14. Circuit configuration optimisation
  - SC B3.26: Guidelines for the design and construction of AC offshore substations
- **AA2 Gas Insulated Substations:**
  - SC B3.17: Residual life concepts applied to HV GIS
  - SC B3.18: SF6 tightness guide
  - SC B3.22: Technical requirements for substations exceeding 800 kV
  - SC B3.25: SF_6 analysis for AIS,GIS and MTS condition assessment

Advisory Areas

- **AA3 Air Insulated Substations:**
  - SC B3.21: Turn key substations
  - SC B3.23: Guidelines for uprating and upgrading of substations

- **AA4 Substation Management:**
  - SC B3.06: Substation management

- **AA5 Secondary Systems:**
  - SC B3.10: Primary/Secondary system interface modeling for total asset performance

Main Activities

- **New Working Groups :**
  - WG B3.23: Guidelines for uprating and upgrading of substations
  - WG B3.26: Guidelines for the design and construction of AC offshore substations for wind farms
  - WG B3.25: SF_6 analysis for AIS, GIS and MTS condition assessment
  - JWG B2/B3.27: Live line maintenance : a management perspective.

- **Preparation of the next SC B3 session 2010 in Paris (Preferential Subjects):**
  - New techniques/new design of substations
  - Existing substations, new challenges
  - New secondary system challenges in substations

Brochures

- WG B3.15: “Guidelines to cost reduction of air insulated substations”
  ELECTRA August 2008
- WG B3/B1.09: “Application of long capacity gas insulated lines in structures”
  ELECTRA October 2008
- WG B3.01: “The impact of new functionalities on substation design”
- WG B3.11: “Combining innovation with standardisation”
- WG B3.17: “GIS – State of the art 2008” (final brochure will follow)
- WG B3.18: “SF6 Tightness Guide” (draft available)
- WG B3.20: “Evaluation of different switchgear technologies (AIS, MTS,GIS) for rated voltages of 52 kV and above”
- WG B3.22 “Technical requirements for substations exceeding 800kV” (draft available)

Future Activities

➢ **Next SC B3 meetings**

- SC B3 SAG/CAG/TAG Meeting on May 7-8, 2009 in Ljubljana/ Slovenia
- SC B3 Meeting on August 21, 2009 in Capetown South Africa
- SC B3 Session on August 27, 2010 in Paris
- SC B3 Meeting in May 2011 in Chicago together with IEEE

➢ **Conference/Colloquium:**

- 6th Southern Africa Regional Conference 2009 on August 17-21, 2009 in Cape Town, South Africa combined with the Cigré SC A2/A3/B3 Colloquium and Tutorial on August 17 and 20, 2009 and the 46th SC B3 Meeting on August 21, 2009

Conclusion

- The challenges in the power grids now and in the future will have an impact on the substations. It is the key role of SC B3 to work on proposals and solutions to cope with these challenges and changes.

- Many activities are running in the SC B3 to handle all the aspects of engineering, construction and operation of existing and future substations

- Cigré members have a wide range of knowledge and expertise. It is the clear goal to offer it to everybody involved in substation projects and management, in particular to young engineers

Thank you for your attention !

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