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**QUALITY ASSURANCE TECHNICAL COOPERATION
AND TRAINING**

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QUALITY ASSURANCE TECHNICAL CO-OPERATION AND TRAINING

Assistance to member States in the field of Quality Assurance is a continuing activity being provided by the Division of Nuclear Power through about 10 TC projects per year.

The technical support includes planning, conducting, supervision and evaluating of training for development of qualified manpower, arranging provision of expert missions, fellowships, scientific visits and equipment, in accordance with the requesting Member States needs.

**LIST OF TRAINING COURSES, SEMINARS AND
WORKSHOPS ON QUALITY ASSURANCE**

ORGANIZED BY THE I.A.E.A.

Interregional Training Courses

- 1.- QA for nuclear power plants, Argonne, USA (23 October - 12 November 1978)
- 2.- QA for nuclear power plants, Madrid, Spain (29 October - 30 November 1979)
- 3.- QA for nuclear power plants, Karlsruhe, F.R. Germany (27 October 10 December 1980)
- 4.- QA for nuclear power plants, Paris, France (11 April - 17 May 1983)
- 5.- QA for nuclear power plants, Karlsruhe, F.R. Germany (10 September 19 October 1984)
- 6.- QA for nuclear power plants, Buenos Aires, Argentina (2 September 4 October 1985)
- 7.- QA during nuclear power plant operation, Karlsruhe, F.R. Germany (23 October - 29 November 1985)
- 8.- QA for nuclear power plants, Saclay, France (5 May - 6 June 1986)
- 9.- Project management strengthening with emphasis on QA, Kalpakkam, India (15 October - 23 November 1990)
- 10.- QA in nuclear power plant operation, Madrid, Spain (14 October - 15 November 1991).
- 11.- QA in nuclear power plant operation and maintenance, Trnava, Czechoslovakia (14 September- 15 October 1992).
- 12.- QA/QC in water reactor fuel development and manufacturing , Saclay, France (5 - 23 October 1992).

National Training Courses, Workshops and Lectures

- 1.- QA for nuclear power plants, Seoul, R. of Korea (3 - 14 November 1980)
- 2.- QA for nuclear power plants, Seoul, R. of Korea (31 January 25 February 1983)
- 3.- Orientation in QA requirements, Cairo, Egypt (23 - 27 April 1983)
- 4.- QA during manufacturing and construction of nuclear power plants, Zagreb, Yugoslavia (2 - 27 April 1984)
- 5.- QA in start-up and commissioning, Manila, Philippines (4 - 29 June 1984)
- 6.- QA/QC in fuel fabrication, Manila, Philippines (16 - 29 June 1984)

- 7.- QA for nuclear power plants (for Iran), Karlsruhe, F.R. of Germany (25 February - 22 March 1985)
- 8.- Inspection of mechanical equipment, Seoul, R. of Korea (6 - 25 May 1985)
- 9.- QA for nuclear power plants, Ankara, Turkey (7 October - 1 November 1985)
- 10.- QA in manufacture of mechanical equipment, Zagreb, Yugoslavia (4 - 22 November 1985)
- 11.- QA in the site construction of nuclear power plants, Suzhou, P.R. China (6 October - 13 November 1986)
- 12.- Inspection and test of electrical equipment, instrumentation and control, Daejon, R. of Korea (17 November - 5 December 1986)
- 13.- QA functions of the plant owner and regulatory body, (mechanical equipment manufacturing and installation) Suzhou, P.R. China (5 - 23 October 1987)
- 14.- QA principles and practices, Mexico (17 - 29 August 1987)
- 15.- QA Requirements for Site Investigation, Casablanca, Morocco (4-8 January 1988)
- 16.- QA during construction of nuclear power plants, Wejherovo, Poland (14 - 25 March 1988)
- 17.- QA functions of the plant owner in design, procurement and installation of instrumentation, control and electrical equipment, Suzhou, P.R. China (3 - 20 May 1988)
- 18.- QA during plant commissioning and operation (Workshop), Qinshan, P.R. China (12 - 23 September 1988)
- 19.- QA in Commissioning and new developments in QA, (Lectures) Beijing, P.R. China (26 - 27 September 1988)
- 20.- QA/QC during Construction of NPP - Inspection of Civil Engineering Work, Wejherovo, Poland (3-14 October 1988)
- 21.- QA for Siting Activities (Workshop), Tikrit, Iraq (11-15 February 1989)
- 22.- Regulatory inspection of mechanical equipment, Suzhou, P.R. China (27 February - 10 March 1989)
- 23.- QA for Mechanical Equipment, Wejherovo, Poland (3-14 April 1989)
- 24.- QA in NPP Siting (Workshop), Jakarta, Indonesia (10-19 May 1989)
- 25.- QA for Managers (Workshop), Tehran, Iran (16-20 September 1989)
- 26.- NPP Equipment Qualification, Zagreb, Yugoslavia (16-19 October 1989)
- 27.- QA in Research and Development Management (Workshop), Daeduk, R.O. Korea (23 October-3 November 1989)
- 28.- QA during Commissioning and Operation, Taejeon, R.O. Korea, (20 November-1 December 1989)
- 29.- QA Programme and NDE Techniques (Workshop), Jakarta, Indonesia (29 November- 8 December 1989)

- 30.- QA for mechanical equipment, Islamabad, Pakistan (15 January -2 February 1990)
31. - QA for computer software (Workshop), Taejeon, R.O. Korea, (11 - 23 June 1990) -
32. - QA auditing for NPP (Workshop), Jakarta, Indonesia, (30 July - 10 August 1990) .
- 33.- Interpretation of IAEA Nuclear Safety Standards (included lectures on Quality Assurance), Baghdad, Iraq (19 May - 7 June 1990)
- 34.- QA in design, procurement and manufacture of NPP, Jakarta, Indonesia, (15 - 27 October 1990).
- 35.- Statistical Quality Control Methods (Workshop), Taejeon, R.o.Korea (15 - 26 April 1991).
- 36.- QA for activities related to siting and design against external hazards (Workshop), Sofia, Bulgaria (6 - 16 May 1991).
- 37.- Quality Assurance during siting, (Workshop), Prague, Czechoslovakia (23 -27 September 1991).
- 38.- QA in design of nuclear power plants, Shanghai, P.R.China (21 October - 1 November 1991)
- 39.- QA for activities related to siting and design against external hazards (Workshop), Ljubljana, Slovenia (23 - 25 March 1992).
- 40- QA considerations and technical procedures of site selection for nuclear power plants (Workshop), Kuala Lumpur, Malaysia (15 - 24 June 1992).
- 41.- QA during nuclear power plant construction (Workshop), Temelin, Czechoslovakia (15 - 19 June 1992).
- 42.- QA auditing (Workshop), Temelin, Czech Rep., (21 - 25 June 1993).
- 43.- QA as a management tool, Balatonfuered and Paks NPP, Hungary (25 - 28 October 1993).

Regional Seminars and Workshops

- 1.- Seminar for Asia and Pacific on QA for nuclear power plants, Bangkok, Thailand (12 - 15 December 1979)
- 2.- Seminar for Latin America on QA for nuclear power plants, Rio de Janeiro, Brazil (17 - 21 October 1983)
- 3.- Seminar for Asia and Pacific on QA during plant operation, Manila, Philippines (20 - 24 January 1986)
- 4.- Seminar on QA for executives, Mexico (11 - 22 May 1987)
- 5.- Workshop on In-Service Inspection Standards plus QA, Madrid, Spain (4-7 April 1989)
- 6.- Workshop on NDT, Audits and Erosion-Corrosion of PPV and Piping of WWER-Type Reactors, Madrid, Spain (17-28 September 1990)

7. Seminar for Europe and the Middle East on Quality Management for Nuclear Power Projects, Prague, Czechoslovakia (12-16 November 1990)
8. On-the-Job Training in In-Service Inspection of Krsko NPP, Zagreb and Krsko, Yugoslavia (26 November - 5 December 1990)
- 9.- Quality management during construction and operation of NPPs (Workshop) Córdoba, Argentina (2 - 6 December 1991).
- 10.- Management control of quality during construction and operation of nuclear power plants (Workshop), Laguna Verde, Mexico (8 - 12 June 1992).
- 11.- Management control of quality in the maintenance of equipment and operative systems (Workshop), Angra dos Reis, Brazil (30 November - 4 December 1992).
- 12.- Quality management during construction and operation of nuclear power plants (Workshop), Cienfuegos, Cuba (19 - 23 April 1993).

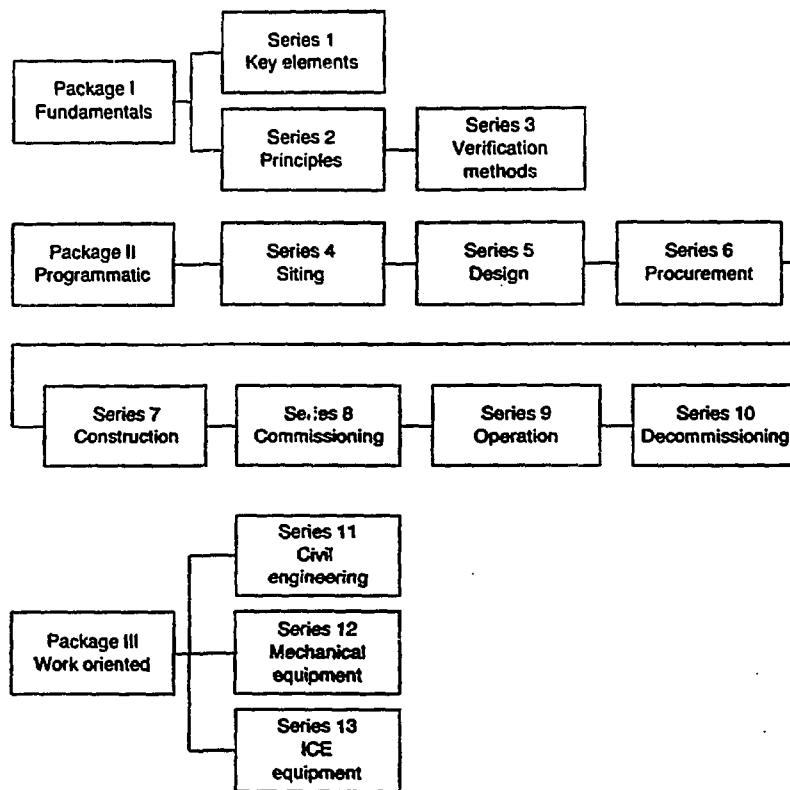
QUALITY ASSURANCE INTEGRATED TRAINING PACKAGES

An IAEA Manual (TRS 340) which provides guidance for establishing training programmes covering Quality Assurance principles and practices was published in 1992.

The document is mainly based on the experience and material collected through the performance of some 50 interregional, regional and national training courses, seminars and workshops on Quality Assurance organized by the IAEA in about 20 countries.

The purpose of this document is to provide a systematic approach for use by the responsible management in developing an overall QA training programme and lecture material for all personnel of a nuclear power plant. The document can be suitably adjusted for various management levels and adapted to the national variables and needs.

STRUCTURE OF THE QUALITY ASSURANCE INTEGRATED TRAINING PACKAGES (For Classroom Training)



ON-THE JOB TRAINING OF QUALITY ASSURANCE

The QA integrated training packages also provide guidance in establishing, implementing and evaluating on the-job training programmes for QA personnel.

It includes qualification requirements for trainees and trainers, performance monitoring, training reports and training programmes, with tables which describe the training subjects, training facilities and training periods for different categories of QA personnel.

QUALITY ASSURANCE REVIEW AND ASSESSMENT MISSIONS

A number of Quality Assurance Review and Assessment missions were carried out in this year by the IAEA in the past a few years to review and assess the implementation and effectiveness of the QA programmes and procedures, including the QA training programmes and procedures, of the nuclear power plants.

For example:

- QA review and assessment on NPP construction, Temelin, CZR, 22 March - 2 April 1993.
- Assessment of PAKS NPP Quality Assurance in NPP operation, PAKS, Hungary, 2 -5 May 1993,
- Assessment of QA programme of Bohunice NPP, Bohunice, SLR, 20 -24 September 1993,
- Assessment of QA programme of Mochovce NPP, Mochovce, SLR, 4 -8 October 1993.

MANAGEMENT TOOL

QUALITY ASSURANCE

**ESSENTIAL ASPECT OF
GOOD MANAGEMENT**

- ANALYSIS OF TASKS
- IDENTIFICATION OF SKILLS
- SELECTION AND TRAINING OF PERSONNEL
- APPROPRIATE EQUIPMENT AND PROCEDURES
- SATISFACTORY ENVIRONMENT
- RECOGNITION OF RESPONSIBILITY

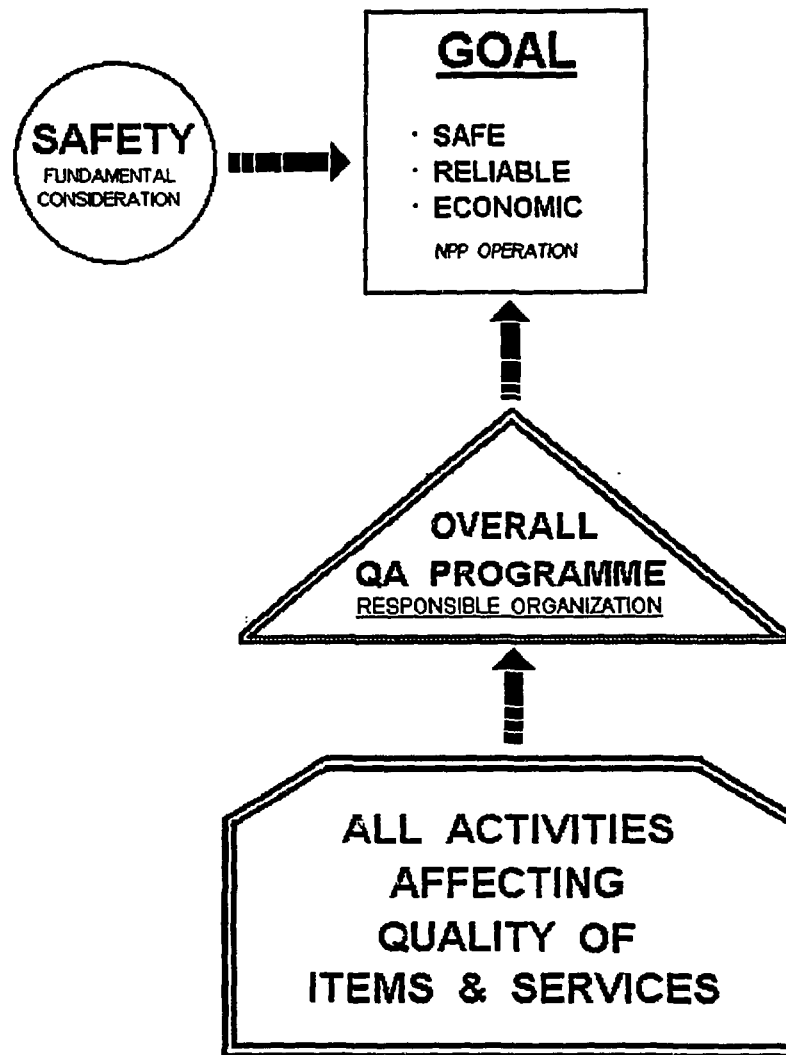
REGULATORY REQUIREMENT

**REGULATORY REQUIREMENT
WITHIN THE NATIONAL LEGAL FRAMEWORK**

- *ESSENTIAL AS REGARD SAFETY*
- *CONSISTENT WITH REGULATIONS*
- *AN INTEGRAL PART OF NPP PROJECT*
- *CONSTRUCTION PERMIT*
- *OPERATION LICENSE*
- *REGULATORY INSPECTION AND ENFORCEMENT*

GOAL OF A NPP

- *Quality of Performance* -



REVISION OF QA STANDARDS

In 1990, the IAEA began a planned and systematic programme to enhance nuclear safety by revising and improving its QA Code and the accompanying Safety Guides.

The initiative is consistent with the conclusions of INSAGs to instill **a new culture within a formal system** which demands continuous enhancement of performance objectives.

It is the intent of this integral revision that users of the IAEA revised QA standards examine their existing QA programmes to identify areas where **improvement** can be made by building in the appropriate QA perception.

SIMILAR CONTENTS

The essential **contents** of a traditional QA programme and a performance-based QA programme are **the same**.

However, the performance-based QA programme focuses on:

- quality of **performance** rather than **conformance** to fine-grained QA requirements;
- implementation and **effectiveness** rather than programme development and **documentation**;
- functions of **managers** together with performance and assessment personnel rather than functions of **QA personnel** only.