Corporate & ACR QA Program

Presentation to CNSC and USNRC Staff

by

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AECL·EACL 1952 50 2002

Canada

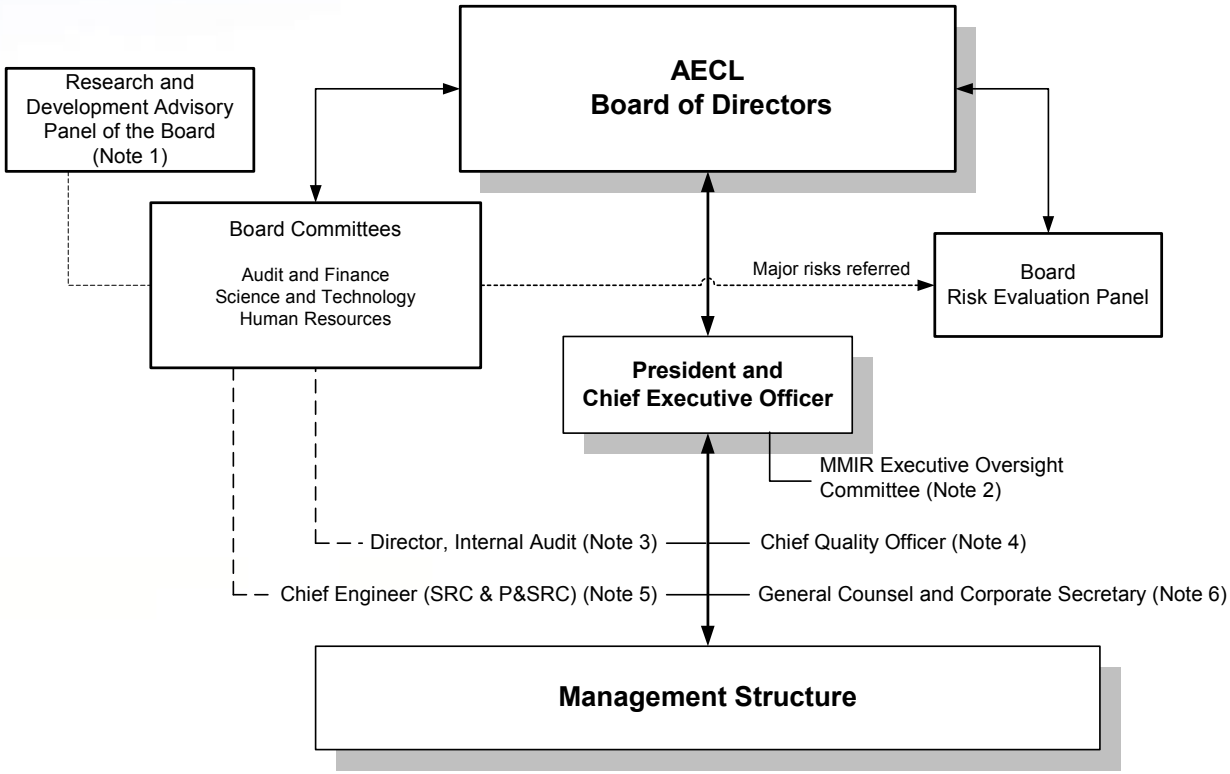
AECL Atomic Energy of Canada Limited

EACL Énergie atomique du Canada limitée

OUTLINE

- AECL Governance Model & Overview of Roles, Responsibilities and Interfaces
- Overview of Corporate QA Program and Applicable QA Standards
- Overview of the ACR QA Program
- Overview of Design Process / Design Assurance
  - Design Process (Design Inputs, Design Outputs)
  - Documenting Design (Document Control / Records Management)
  - Design Verification
  - Design Authority
  - Change Control/Management
  - Assessments (internal audits, self assessments, program reviews)
  - NCR/CAR Process
  - Key Applicable Procedures
- Internal ACR audits/assessments/NCRs
- Corporate Oversight Audits

AECL Governance Model



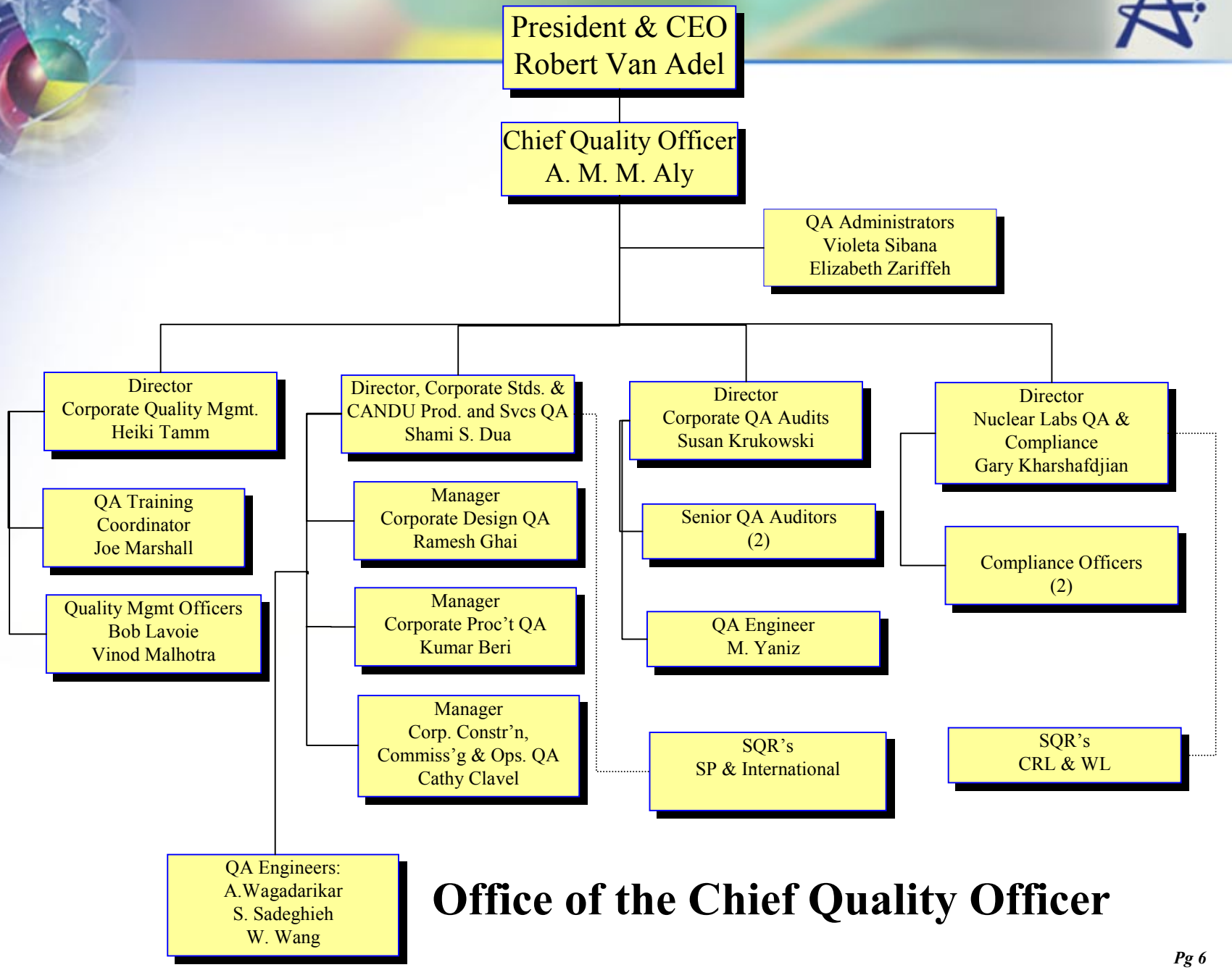
Responsibility of Line Management

- **Overall responsibility and accountability for the quality of their products and services including:**
  - development and implementation of QA programs
  - development and implementation of audit plans
  - regular program reviews and assessment, etc.

QA staff are assigned to line management to facilitate development and implementation of QA program.

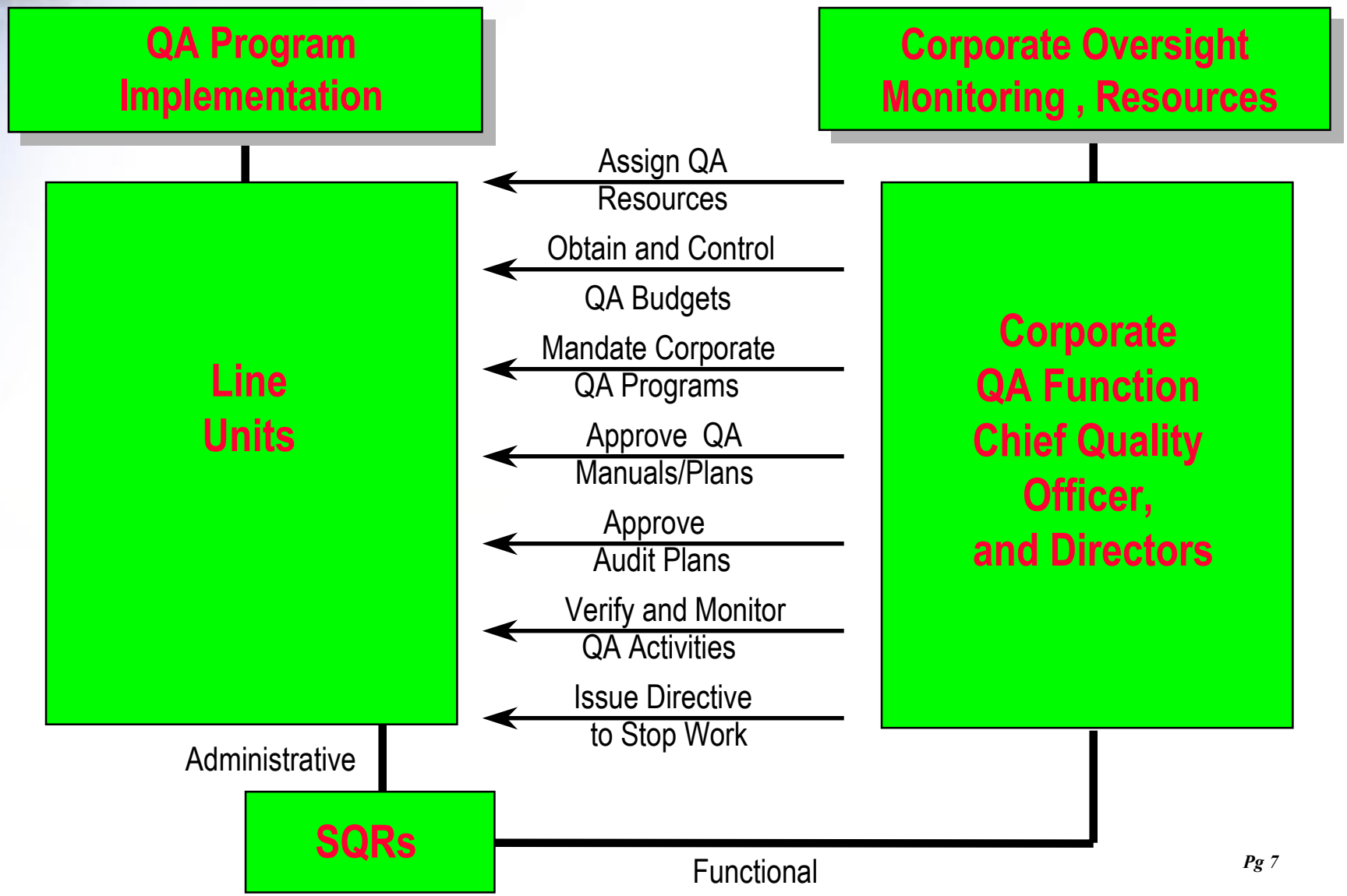
Responsibility of Corporate Quality

- The CQO reports to the President & CEO (Independence)
- Ensuring that AECL conforms to Quality standards
- The development and maintenance of the AECL Quality Management System, including Resource Management of QA staff
- Corporate Oversight Function (Oversight Audits & Compliance)
- Authority to issue a directive to stop work if conditions adverse to quality are not addressed in a timely manner



Office of the Chief Quality Officer

Responsibilities for QA Program

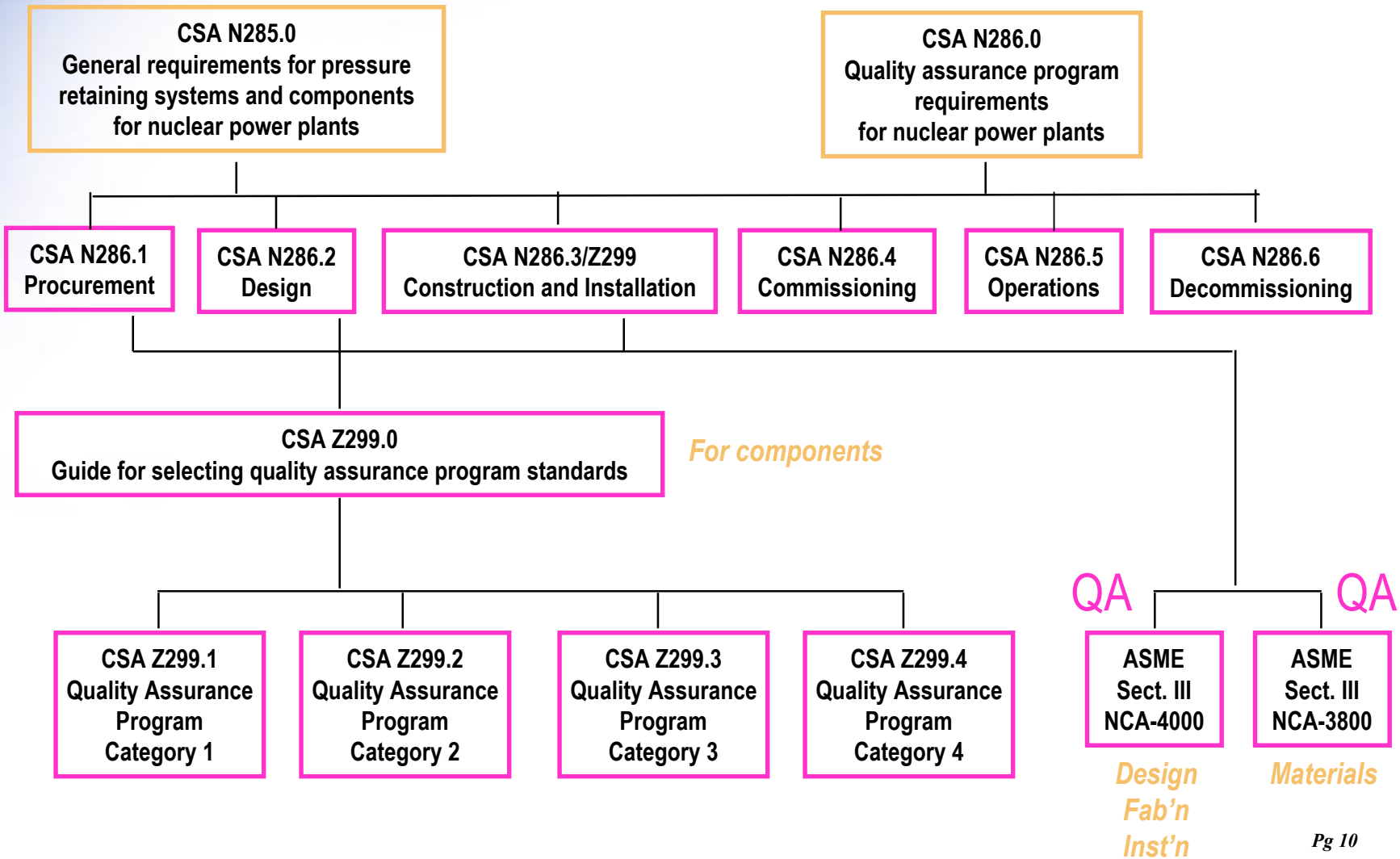


- Overview of CANDU QA Standards
- AECL Management System
- AECL Corporate QA Program

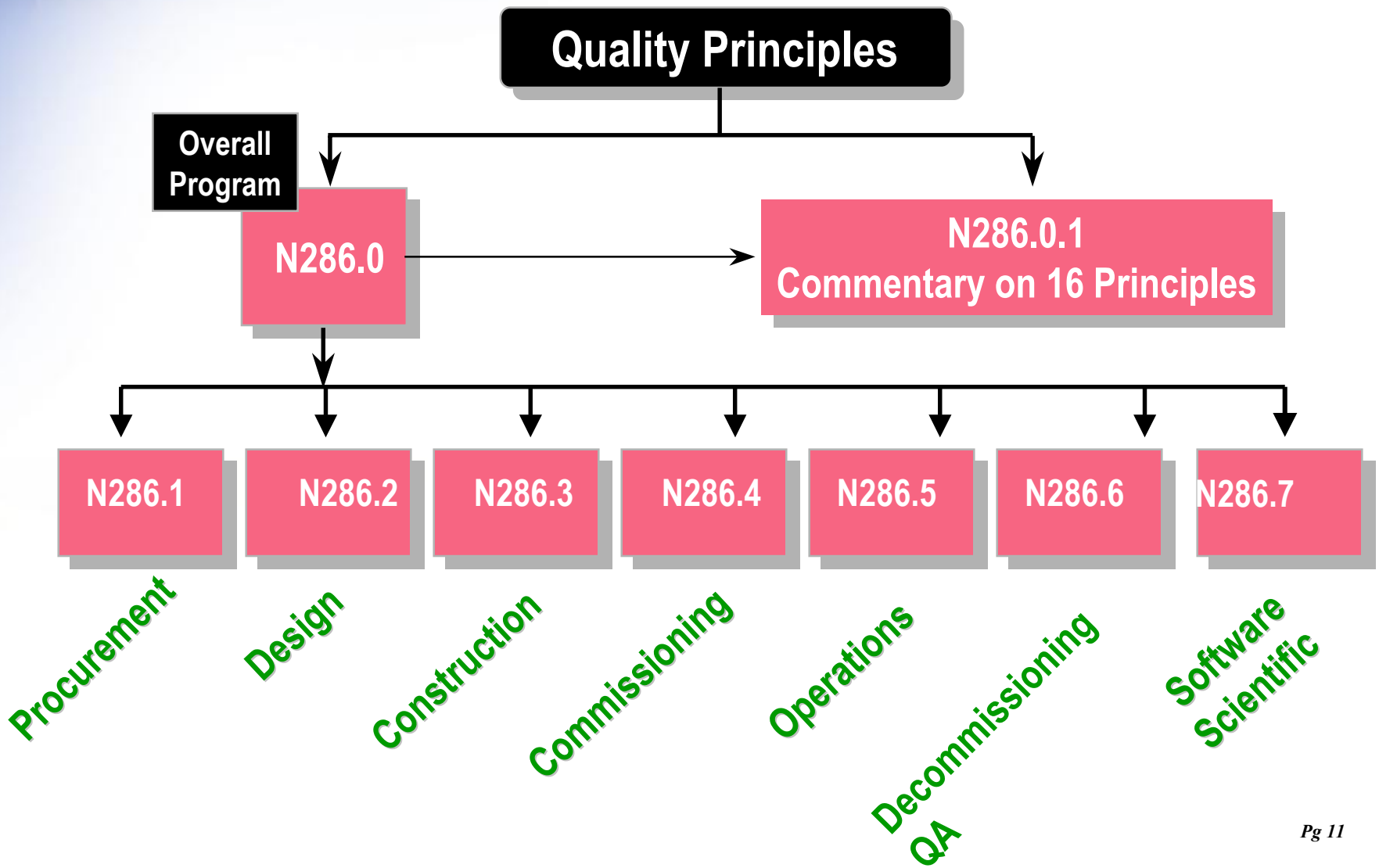
Overview of CANDU QA Standards

- CSA N286 series
- CSA Z299 series
- CSA N285.0 / ASME Section III
- CSA Q 396
- IAEA 50-C/SG-Q
- ISO 9000
- 10 CFR 50 APP. “B”
- NQA-1
- CNSC Standard S-213 (Draft)

Relationship of Canadian Quality Assurance Standards



The CSA N286 Series of Standard



CANDU QA Standards, N286 Series

- CAN/CSA-N286.0 Overall QA reqts. for NPP
- CSA-N286.1 Procurement quality assurance
- CSA-N286.2 Design quality assurance
- CSA-N286.3 Construction and installation QA
- CSA-N286.4 Commissioning quality assurance
- CSA-N286.5 Operations quality assurance
- CSA-N286.6 Decommissioning quality assurance
- CSA-N286.7 Scientific software quality assurance

CSA N286 series

- **The series comprises two tiers:**
  - The first tier Standard CAN / CSA- N286.0 is addressed to the Owner of the NPP. It contains the requirements for the overall QA program that complies to the complete life cycle of a NPP from conceptual design to decommissioning.
    - **states the principles for assuring the achievement of quality**
    - **Covers corporate activities associated with specifying, directing and administering work in all phases of the NPP life cycle**
    - **And the integration of the activities and programs of all participants**

CSA N286 series

- **The series comprises two tiers: (contd.)**
  - Each second-tier Standard embodies the principles set forth in N286.0. The sub-tier includes specific program requirements, limits of responsibility, authority and application of criteria as they apply to the specific needs of each of the phases of a NPP life cycle

CSA N286 series

- The CSA N286 Standard has been prepared; it consolidates all N286 series into a single N286 Standard
- The New Standard has been balloted and accepted for publication and release (2005 ?)
  - It has now become N286 “Management System Requirements For Nuclear Power Plants”

CANDU QA Standards, Z299 Series

In addition to the N286 series, the following standards cover the manufacturing and supply activities

- CAN3-Z299.1 Quality assurance program, category 1 (Preventive, Design +)
- Z299.2 Quality assurance program, category 2 (Reactive, Manufacturing)
- Z299.3 Quality assurance program, category 3 (Verifying, inspection & test)
- Z299.4 Quality assurance program, category 4 (Sorting, commercial quality)

ISO 9000 QA Standards

Canada

DND Standards (1966)

Industry Standards (1969)

CSA Z299 (1974)

CSA Z299 (1978)

CAN3 Z299 (1985)

CAN3 Q9000 (1990) ← ***ISO 9000 (1987)***

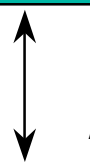
CAN/CSA ISO 9000 (1994) ← ***ISO 9000 (1994)***

CANDU QA Standards and ISO 9000

- *SCC/CSA Standards*

Nuclear	Non-Nuclear
N286 Nuclear Life Cycle	Z299 Manufacturing & Procurement

- *ISO 9000 Standards*
  - No specific standard for nuclear industry
  - Dialogue started with IAEA, Comparison document, New IAEA Standard aligned with ISO

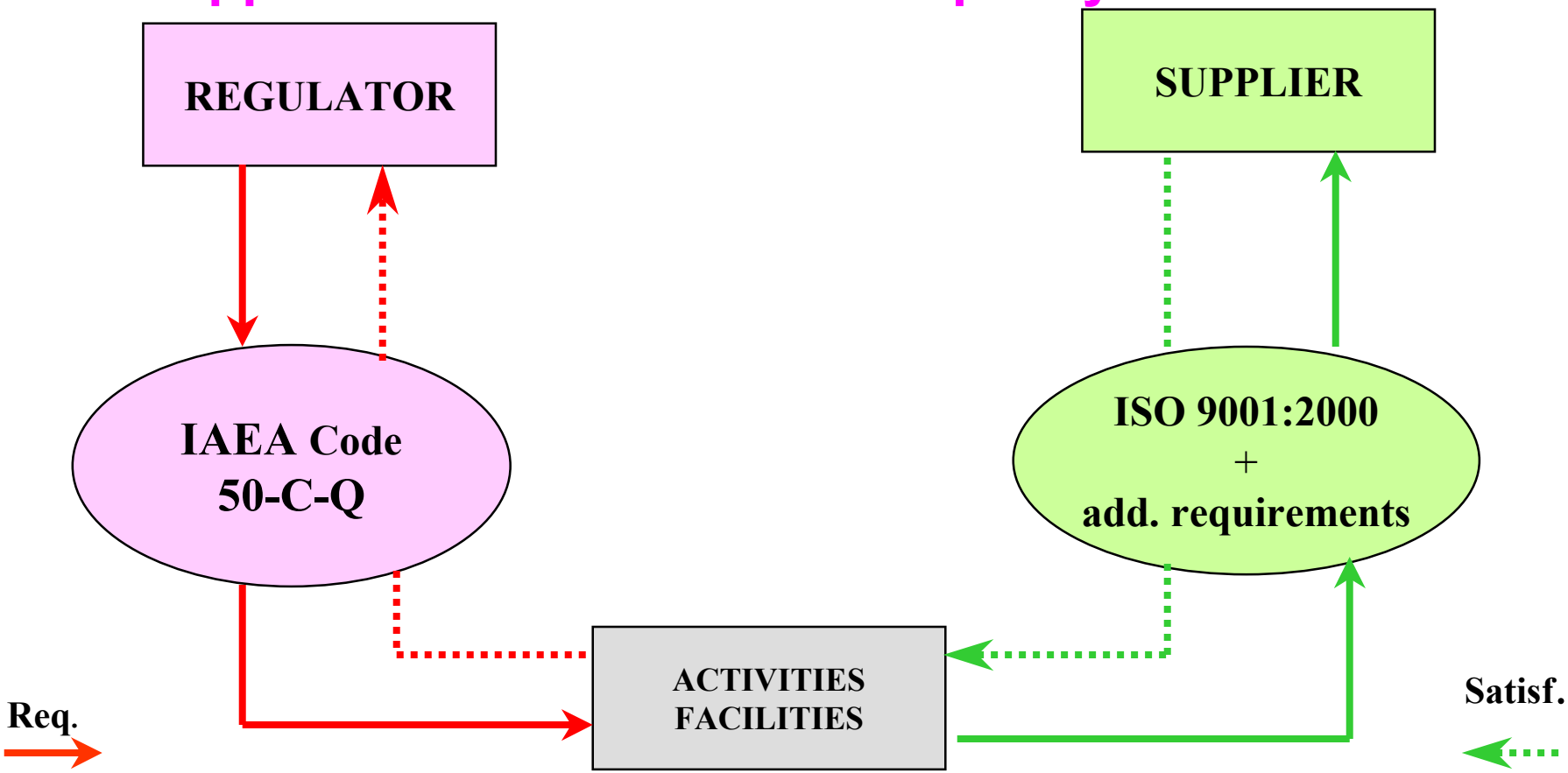


Comparison AECL 00-933.4.2

ISO 9000 Quality Management

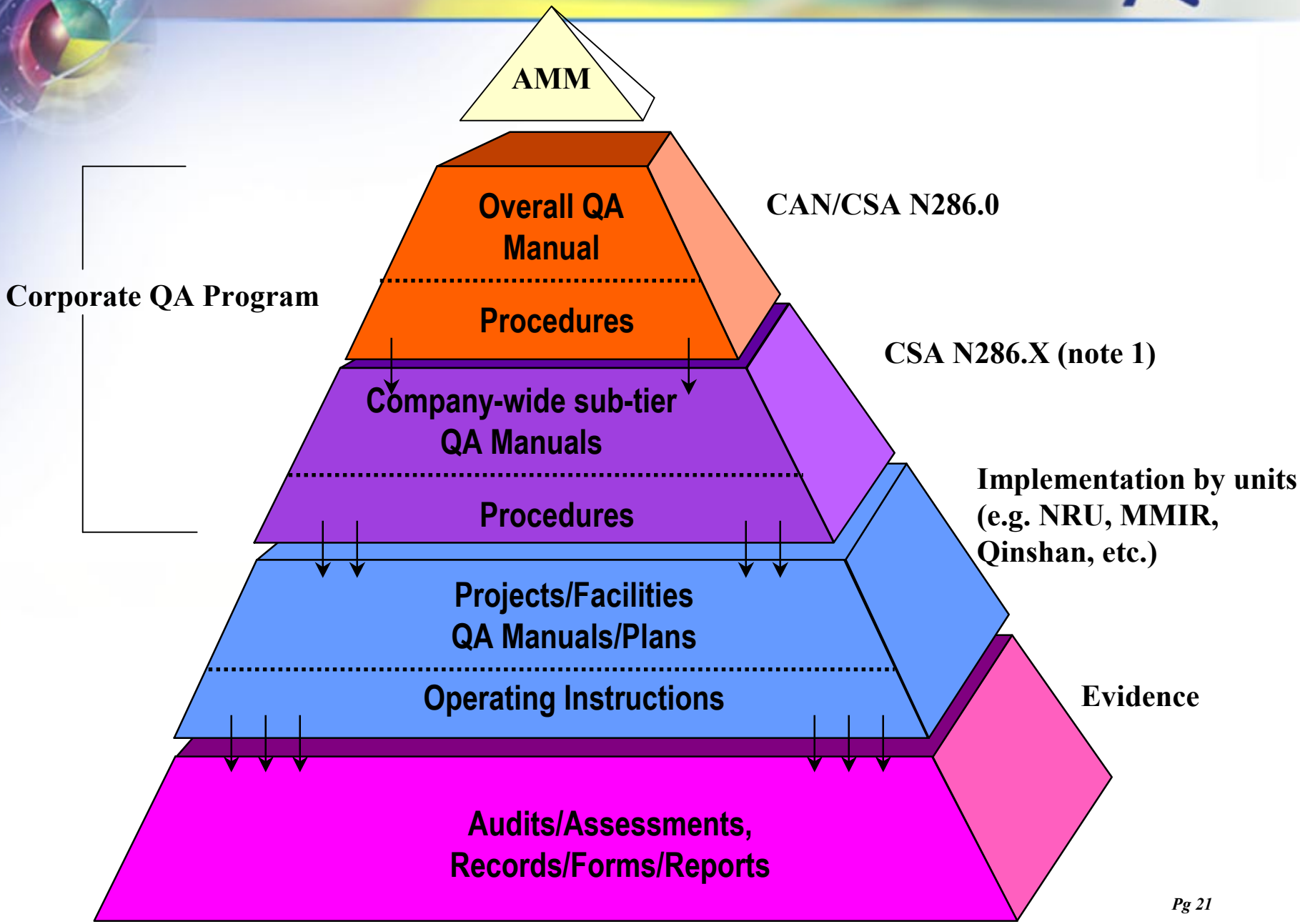
Notes: - Canada/CSA adopted 1994 ISO 9000 as National Standards
- Z299 Standards may be withdrawn in the near future

Application of IAEA and ISO quality standards



CSA N285 series

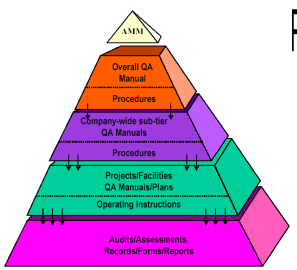
- The N285.0 is one in a series to provide uniform rules for the design, fabrication, installation and inspection of pressure –retaining systems and components in CANDU NPPs. The series states the requirements that are particularly applicable to the NPPs located in Canada and references the requirements of the ASME Boiler and Pressure Vessel Code as appropriate
  - Rules for classifying systems and components based on CNSC safety philosophy
  - Acceptability of the QA Program by Canadian Jurisdictions, etc.


AMM
Overall QA Manual
Procedures
Company-wide sub-tier QA Manuals
Procedures
Projects/Facilities QA Manuals/Plans
Operating Instructions
Audits/Assessments, Records/Forms/Reports
Corporate QA Program
CAN/CSA N286.0
CSA N286.X (note 1)
Implementation by units (e.g. NRU, MMIR, Qinshan, etc.)
Evidence

AECL Management Manual (AMM)

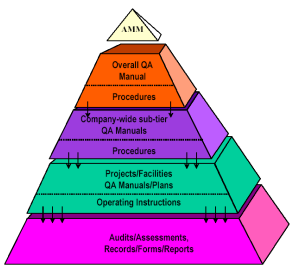
- AECL Corporate Overview
- Mandate, Vision
- Overall Management System
- AECL Offices
- Principles, Policies
- Organization
  - BODs, President & CEO, Executive & EMC
  - Operations Group, Corporate Services Groups, CQO, CE, etc.

  Panels and Teams for Integration and Governance



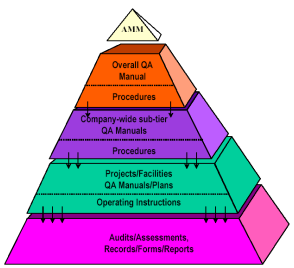
AECL Management Manual (AMM)- Contd.

- Business Process Management
- Compliance Management
- Assessment & Review
- Appendices on Code of Conduct, Policies, BODs, Operations Group, Corporate Services Groups, Business Processes, Compliance Requirements, Site Facilities & Offices



Values

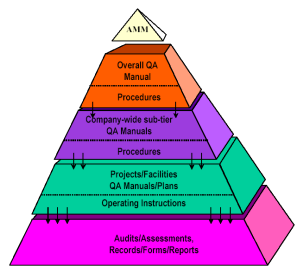
- Driven by Customer needs
- Obsessed by Quality, Excellence and Safety
- Personally Responsible & Accountable
- Engaged in Open and Honest Communication
- Empowered to Challenge & Innovate
- Committed to Learning & Teamwork
- Motivated by Performance



AECL Policies

AECL Overall and Sub-tier QA Programs

- CW Overall 00-01913-QAM-010
  - CW Design 00-01913-QAM-005
  - CW Procurement 00-01913-QAM-011
  - CW Analytical, Scientific and Design Computer Programs 00-01913-QAM-003
  - CW R&D 00-01913-QAM-018
  - CW Construction QAM (in preparation)
  - CW Commissioning QAM (in preparation)
  - CW Decommissioning 00-01913-QAM-016

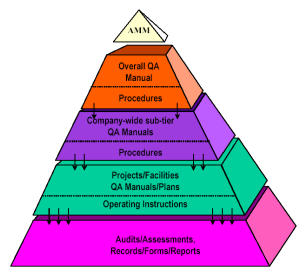


R& D QA Standards

- IAEA 50-C/SG-Q
- ISO 9001:2000
- ASQ / ANSI Guide
- N286 series as applicable

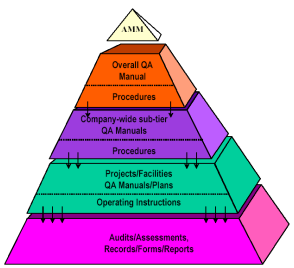
AECL CW R&D QA Program

- Based on ISO 9001:2000 format
- Sub-set of Corporate suite of QA programs
- As a minimum R&D activities are conducted to the requirements of ISO 9001:2000
  - N286 requirements are applied to work in support of design, procurement, operation, software & decommissioning activities that are licensed
  - Work done in support of CANDU power projects
  - N286 requirements imposed through work orders



AECL CW R&D QA Program (contd)

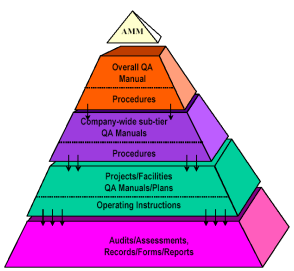
- Three QA levels are defined for R&D activities
- QA Level I, II & III
  - Level assigned by the Contract Officer in consultation with the customer and line management
  - For QA Level I (high), the requirements of N286 based CW programs for Design, Procurement, etc. are imposed
- CPFS and NLBU laboratories are certified to ISO and N285 / ASME by the local jurisdictional authorities



Management Commitment

- The provisions in this Manual, supporting company-wide quality assurance manuals, and procedures are mandatory and shall be implemented by AECL line units, projects and nuclear facilities. Project and job-specific QA programs may be developed to address the specific scope and requirements of their contracts and customers. However, these QA programs must comply with, and be consistent with, the requirements described in this Overall QA Manual.

- This Commitment is signed by all Executives including President & CEO.



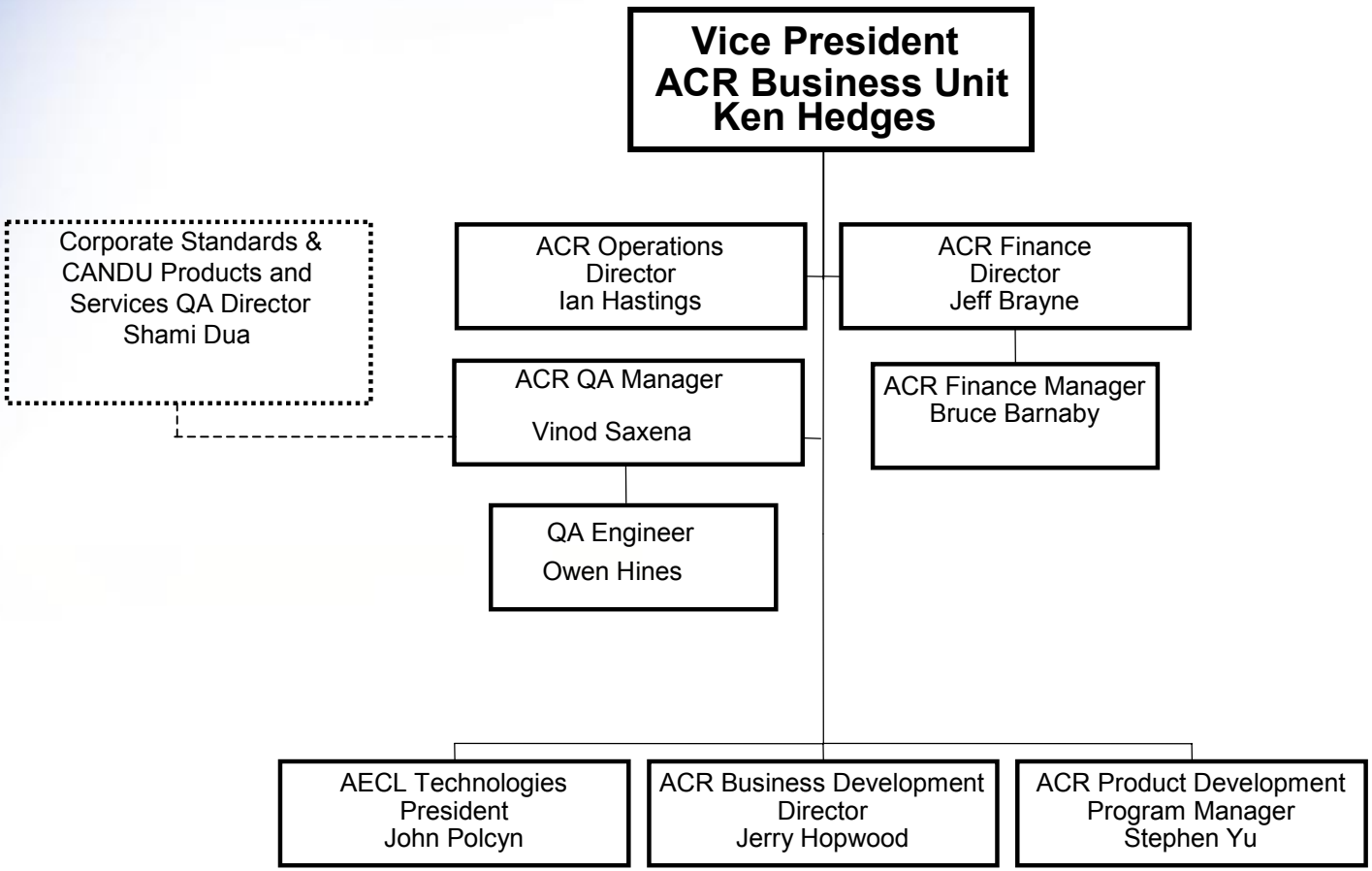
AECL's ISO 9001 Certification

- Obtained ISO 9001:1994 certification for SP site in 2000 May from QMI (a part of CSA / SCC)
- Have obtained corporate ISO 9001:2000 certification for AECL covering all sites
  - Very broad scope covering R&D, Design Engineering, Procurement, Manufacturing, Qualification Testing, Construction, Commissioning, Decommissioning, Waste Management, Services including Inspection, Maintenance and Plant Life Management; and
  - Project Management for CANDU & other Nuclear Power Plants, Research Reactors, Nuclear Facilities & Installations:
  - Operation of Research Reactors and Nuclear Facilities

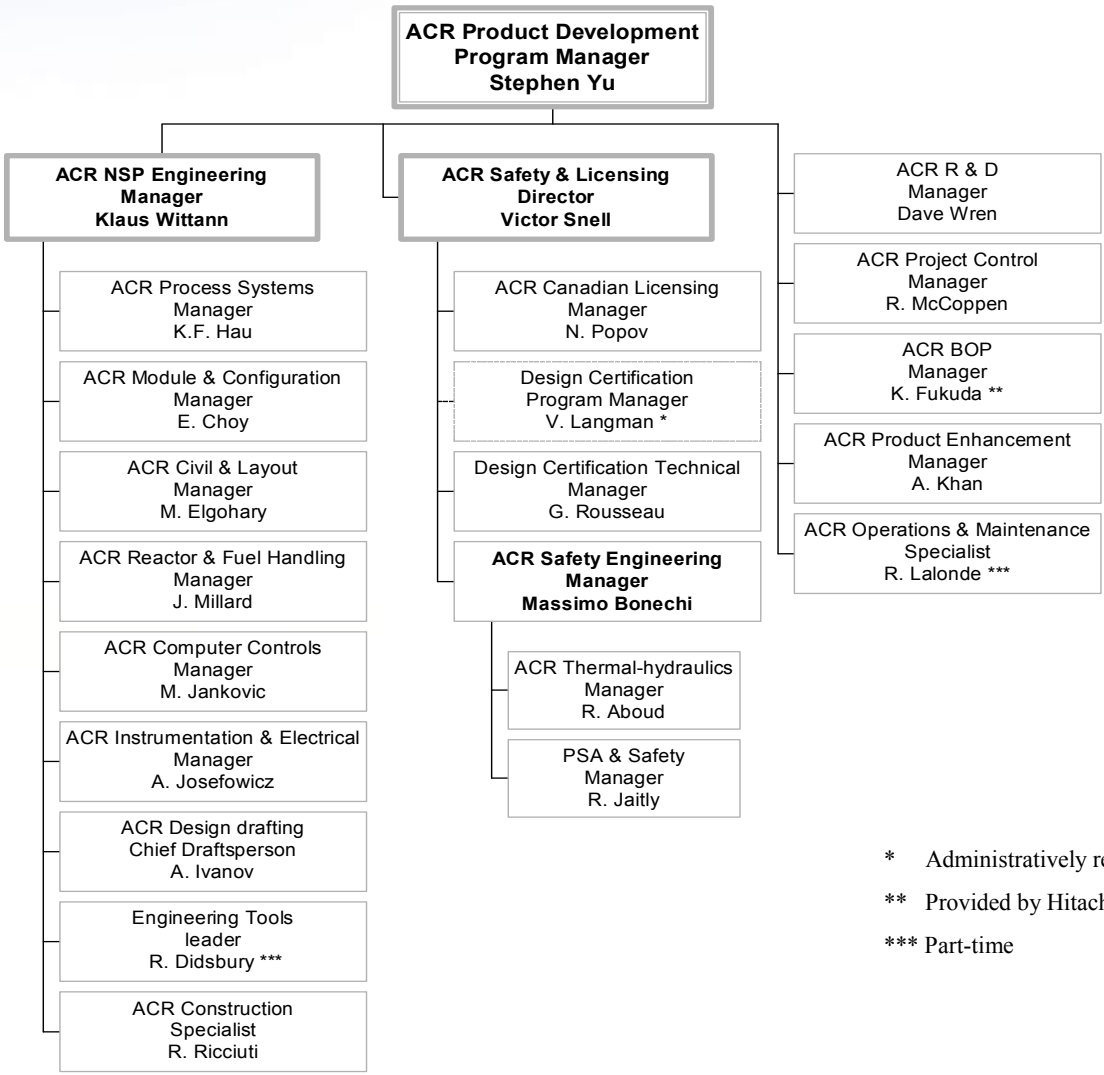
USE Of Corporate QA Programs by Line Units

- Line Units (ACR, etc.) comply with the suite of corporate QA programs as applicable
- Based on the scope of activities, contracts, projects, the appropriate combination of corporate suite of QA programs is selected (00-series of manuals & procedures)
- Additional project specific customer, regulatory, and contract requirements are included into line units QA program documents (Manuals, Plans, OIs)
  - ACR QA Manual & Procedures cover such specific requirements (a combination of 00 & 108 documents)

ACR Business Unit



ACR Product Development



* Administratively reports to AECL-T President

** Provided by Hitachi

*** Part-time

ACR QA Program

ACR QA Program is based on:

- AECL Policies and Procedures
- AECL Corporate QA Programs (Overall and sub-tier Design and others)
- CSA Standard for Design N286.2-00 (plus additional QA requirements from other standards such as ASME NQA1 as applicable)

ACR QA Program

- Defined in the ACR QA Manual and the supporting procedures
- Supplementary to the Corporate Overall and the sub-tier Design QA Manual & procedures
- Covers overall design development and analysis, and licensing activities
- R&D activities in support of ACR follow the R&D QA Manual or CPFS QA Manual and the supporting procedures, acceptable to ACR project (through the Corporate QA)
- Scientific and analysis software development is as per the Corporate SQA Manual and the supporting procedures
- Procurement activities for qualification tests in accordance with the Corporate Procurement QA Manual and the supporting procedures as identified in the Corporate R&D and CPFS QA Manuals.
- Manufacturing and tests in accordance with the suppliers' QA program, acceptable to AECL / ACR management.

ACR QA Manual

- Purpose and Scope
- Quality Policy
- Certification and Commitment
- Organization, Roles and Responsibilities and Interfaces
- Applicable processes/procedures (Corporate and project-specific) for Performance, verification and assessment activities
- Cross Reference Tables for comparison against N286.2 and ISO9001:2000 (Comparison against NQA1 to be added)

C/W Design QA Manual

0.Introduction

1.Scope

2.Definitions and Referenced Publications

3.Basic Requirements

4.Work Control

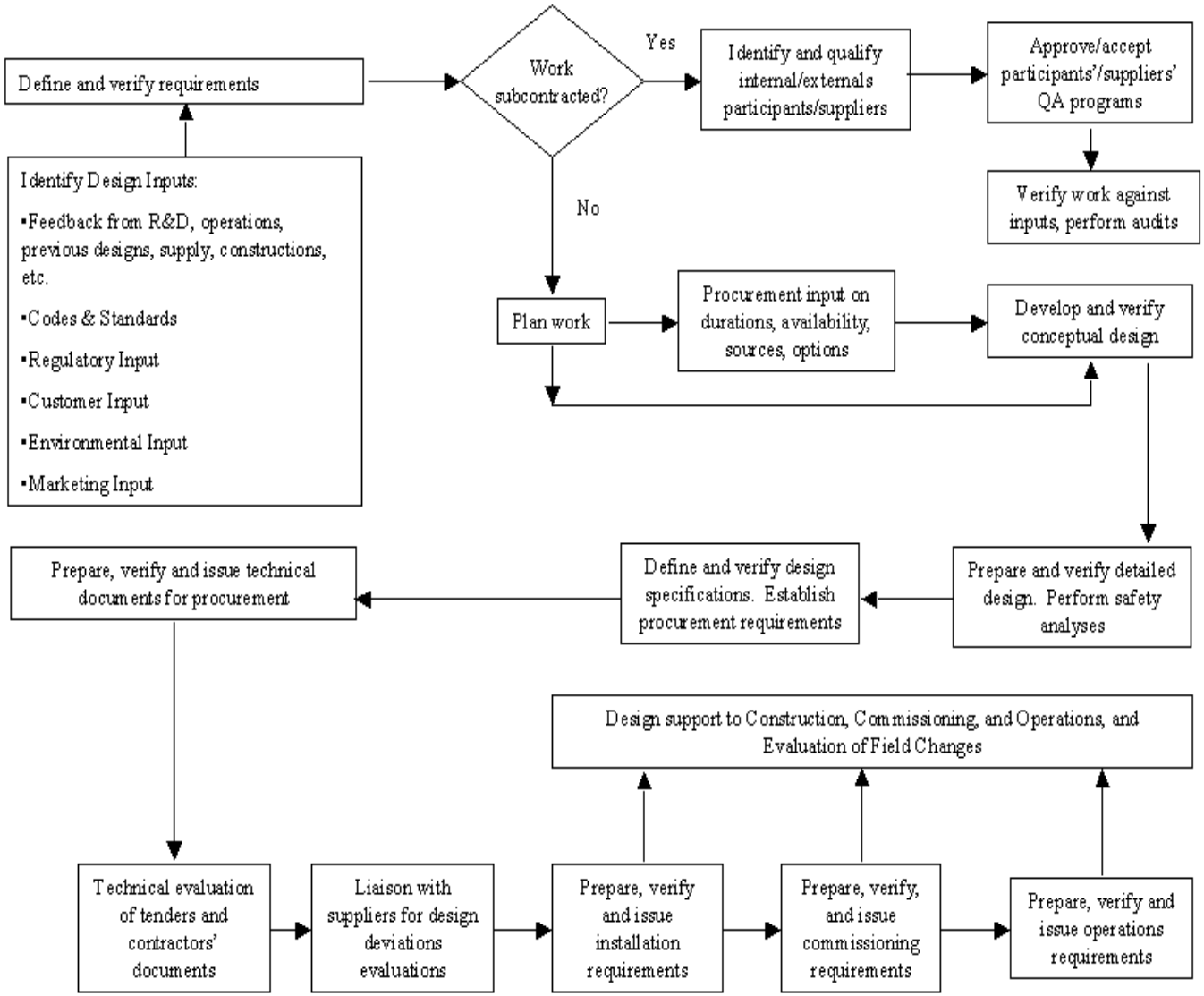
5.Design Process

6.Qualification Testing

Design Inputs, Design Development, Design Documentation, Design Verification, Design Changes, Design Records

3.1Program Definition
3.2Policy
3.3Organization and Responsibilities
3.4Personnel Capability
3.5Accountability
3.6Communication
3.7Use of Experience
3.8Work Planning and Control
3.9Control of Processes and Practices
3.10Verification
3.11Nonconformances
3.12Corrective Action
3.13Change Control
3.14Document Control
3.15Records
3.16Program Assessment (independent assessment, self-assessment, program review etc)

Plus Procedures Listing & Cross Reference Tables


Define and verify requirements
Work subcontracted?
Yes
Identify and qualify internal/externals participants/suppliers
Approve/accept participants'/suppliers' QA programs
Verify work against inputs, perform audits
No
Identify Design Inputs:
•Feedback from R&D, operations, previous designs, supply, constructions, etc.
•Codes & Standards
•Regulatory Input
•Customer Input
•Environmental Input
•Marketing Input
Plan work
Procurement input on durations, availability, sources, options
Develop and verify conceptual design
Prepare and verify detailed design. Perform safety analyses
Define and verify design specifications. Establish procurement requirements
Prepare, verify and issue technical documents for procurement
Design support to Construction, Commissioning, and Operations, and Evaluation of Field Changes
Technical evaluation of tenders and contractors' documents
Liaison with suppliers for design deviations evaluations
Prepare, verify and issue installation requirements
Prepare, verify, and issue commissioning requirements
Prepare, verify and issue operations requirements

Key Elements of the Design Process

- Design Inputs (Design Requirements)
- Design Outputs
- Documenting the Design
- Design Verification
- Design Changes

Design Inputs

- Design inputs define the requirements to be satisfied by the design. Examples of design inputs are functional and performance requirements, safety and licensing requirements, codes and standards, results of conceptual studies, previous experience and feedback (see also the next chart)
- Examples of design input documents are: DCD,ASD,DR,DG,SDG etc.
- Design inputs are identified and properly reviewed, approved and documented.

Design Inputs

EXAMPLES:

- Contract / Proposal
- Design Feedback
- Applicable Codes / Standards
- Regulations
- Environmental Qualification
- Human Factors
- Hazard Analysis
- Fire Protection
- Reliability / FMEA
- Periodic Inspection Program
- Others

→ **Design Requirements**

See DR (FDDM)

Design Feedback

- Feedback obtained from:
  - operating stations
  - construction/commissioning
  - suppliers
  - R&D
- Feedback evaluated and incorporated into design
- Corporate FMS Database

Design Outputs

- Designs output documents describe the design.
- Examples of design outputs are design drawings, technical specifications, design specifications, calculations, technical reports, stress reports, analysis reports, design manuals, Licensing submissions.
- Design outputs support procurement, fabrication, construction, installation, commissioning, operation, and licensing.
- Design outputs provide sufficient details to permit adequate design verification.
- Procurement documents and test specification documents specify QA requirements and the applicable QA standards.

Design Outputs (Contd)

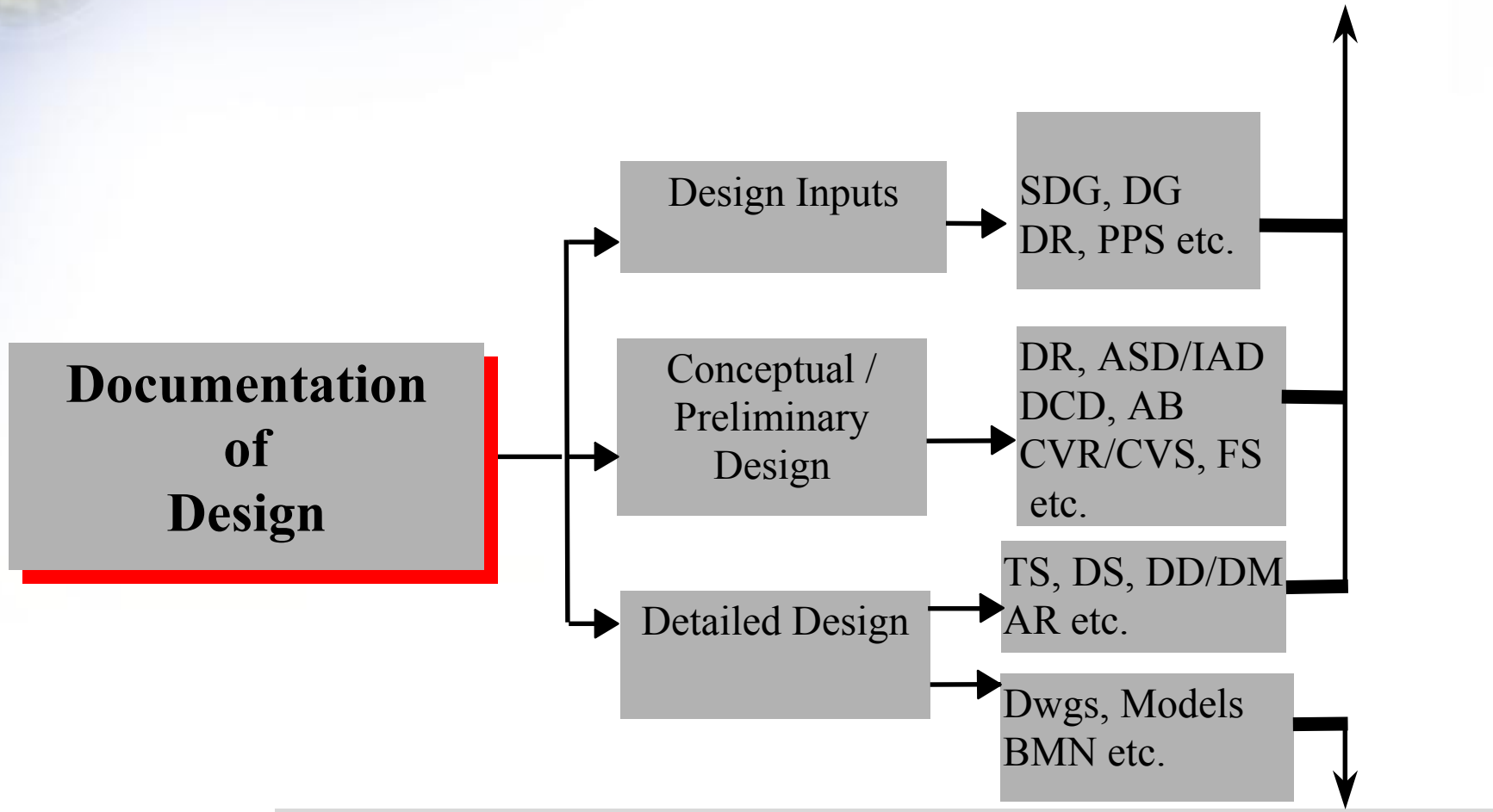
- Test and development work is performed as defined in test specifications and meets the defined acceptance criteria.
- Software used for design and safety analyses are identified. Software used for design and safety analyses are developed, maintained, verified and validated as per the Corporate Software QA Program.

Documenting the Design

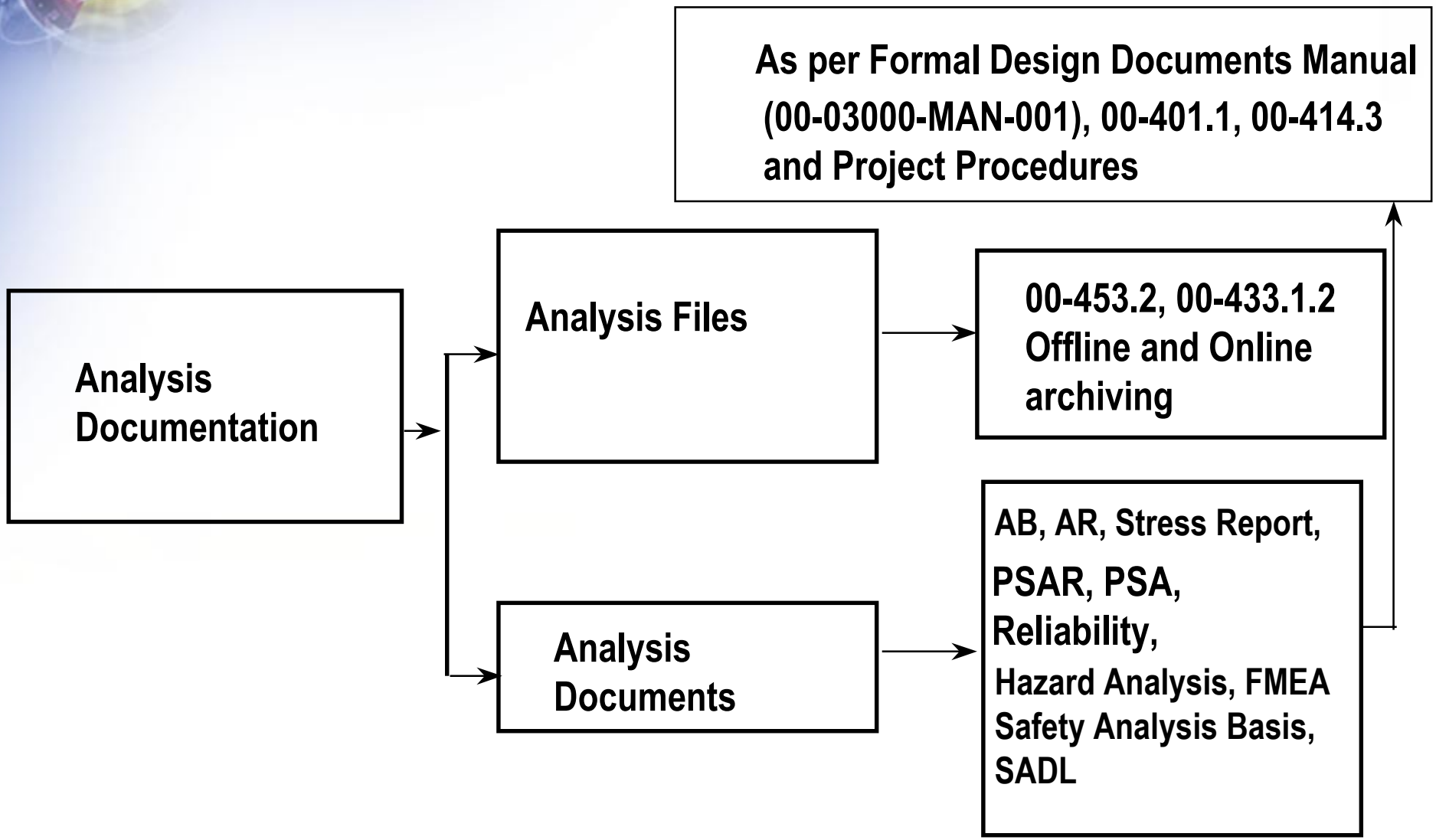
Design Information is documented:

- design inputs / design requirements
- design outputs (for procurement, design registration and licensing, testing, construction, commissioning, operation etc.)
- documents which substantiate adequacy of design

As per Formal Design Documents Manual
(00-03000-MAN-001), 00-401.1, 00-414.3 and Project Procedures



As perEngineering and CADDS Drawing Manuals


As per Formal Design Documents Manual (00-03000-MAN-001), 00-401.1, 00-414.3 and Project Procedures
Analysis Documentation
Analysis Files
00-453.2, 00-433.1.2 Offline and Online archiving
Analysis Documents
AB, AR, Stress Report,
PSAR, PSA,
Reliability,
Hazard Analysis, FMEA
Safety Analysis Basis,
SADL

Formal Design Documents Manual (00-03000-MAN-001)

- Identifies purpose and contents in detail of major formal design documents

  Examples: DR, CVS, CVR, DCD, SDG, AR, DD/DM etc. (See the next sheet)
- Contents depend on document type ----- the end use.
- Document contains information for the purpose for which it is intended.
- Requirements for contents originate from experience, nuclear codes and standards (ASME, N285.0, regulations etc as applicable).

Formal Design Documents Manual (00-03000-MAN-001)

and the companion procedure 00-401.1 Document Types

Document Types includes:

- AB (Analysis Basis)
- AR/ANL (Analysis Report)
- ASD (Assessment Document)
- CVS (Component Verification Spec)
- CVR (Component Verification Report
- DR (Design Requirement)
- DS (Design Specification)
- TS (Technical Specification)
- CSS (Component Specification Sheet)
- DG (Design Guide)
- DD/DM (Design Description/Manual)
- DRP (Design Report)
- MM (Maintenance Manual)
- PPS(Plant Performance Spec)
- PSA (Probabilistic Safety Analy)
- SADL (Safety Analysis Data List)
- SDG (Safety Design Guide)
- PSAR/FSAR (Safety Anal Rep)
- SID List (System Installation
- TED (Technical Description)
- TS (Technical Specification)

This is a living document; other document types are added, as necessary.

Document Control Process

Corporate Overall Process for Document Control 00-414.3 (see the next two sheets)

ACR Application for Electronic Documents: 108-414.3.1

Records Management

Corporate Procedures: 00-400.1 and 00-400.3

Document Control Process 00-414.3 (Key Steps)

(1) Author or Project Document Control

- ❑Identifies / confirms the document number.
- ❑Ensures that the document number has been registered in the project deliverable list (as applicable).

(2) Author

- ❑Prepares the draft document (assisted by Document Services, as required) in accordance with the Company formal document template, as applicable.
- ❑Completes and signs the review and comment transmittal sheet and the title page.

(3) Section Head /Team Leader / Manager

- ❑Reviews the draft document.
- ❑Approves the draft document before it is issued for review purposes.
- ❑Signs the review and comment transmittal sheet and the title page.

(4) Author

- ❑Issues the draft document for review purposes in accordance with Procedure 00-531.4. (Takes help from project document control, as needed and as applicable).

(5) Reviewers

- ❑Review the document and send their comments to the author.
- ❑Specify all significant comments on the comment disposition sheet.

(6) Author

- ❑Incorporates reviewers' comments into the document and dispositions them in accordance with Procedure 00-531.4.

(7) Reviewers

- ❑Sign the comment disposition sheet.

Document Control Process 00-414.3 (Key Steps)

(8) Author

- **Submits the revised document to document approver (via the project document control, as applicable) together with the document cover sheets and QA records.**

(9) Document Approver

- **Approves the document.**
- **Ensures that the document meets the requirements.**
- **Signs the transmittal sheet and the title page.**

(10) Author and / or Project Document Control (as applicable)

- **Issues the approved document (or sends it to the Project Document Control for large projects/programs, as applicable).**
- **Registers the electronic document into the electronic database**
- **Sends the originals and all the QA documentation to record management centre.**

(11) Records Management

- **Stores copies of approved documents (as well as originals).**
- **Stores all QA records.**
- **Archives earlier revisions of the documents, physically separated form the current revisions.**

Design Verification

- **Corporate Procedures 00-501.1/ 00-531.1**
  - Verification done by independent competent staff
  - Verification applied in a graded manner
  - Responsible manager identifies verification activities (DV Plan / Work Activity Plan) covering the scope, timing, methods and extent of verification activities
  - DV Plans for major projects are approved by the Chief Engineer
  - Procedures provide detailed requirements on verification methods, selection criteria and other details

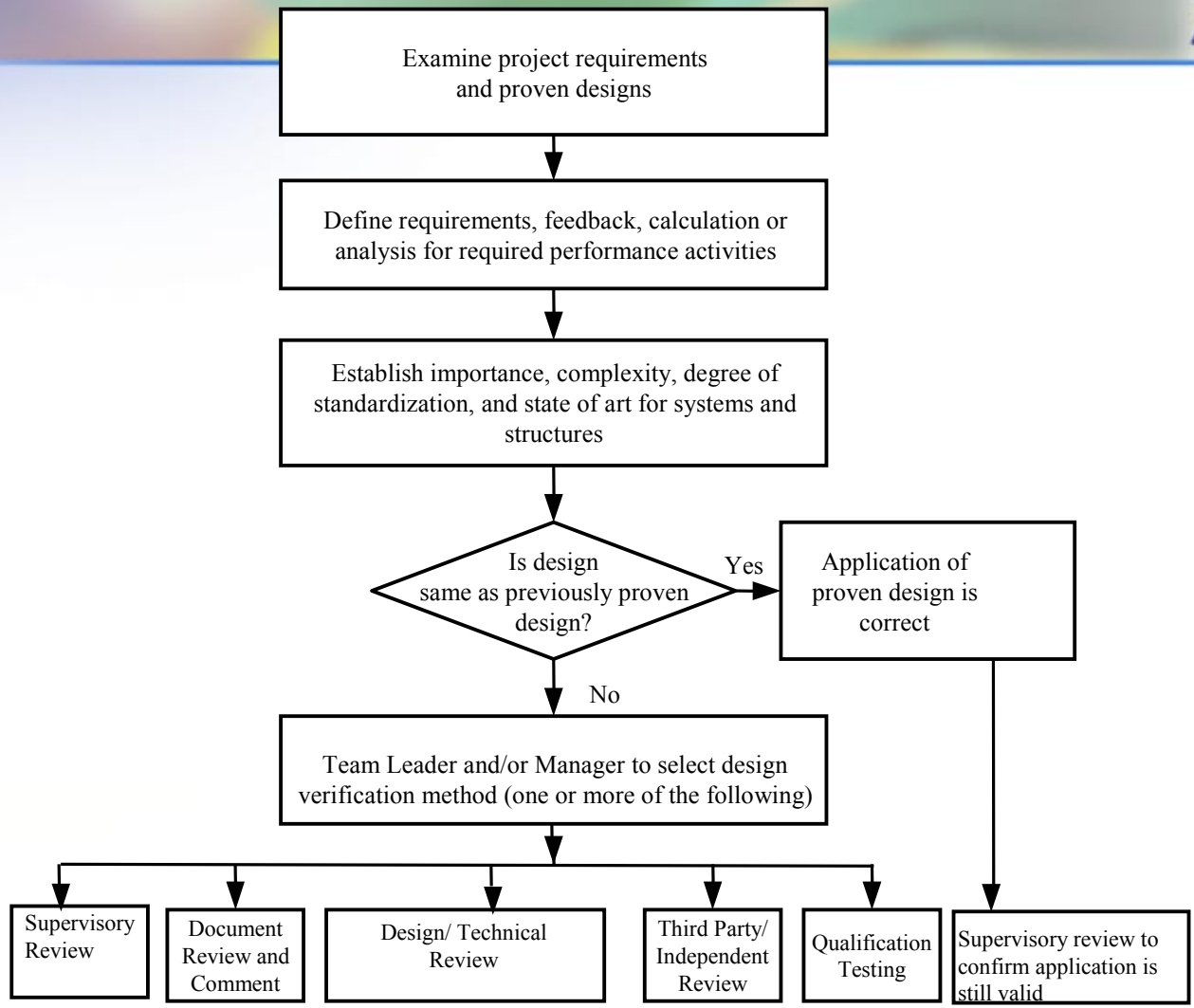
Key Design Verification Activities

- Develop Design Verification Plan / Work Activity Plans which include:
  - Design Activities
  - One or more of the following verification methods as per the defined criteria:
    - Reviews: Document Review and Comment; Design/Technical Review; Third Party Reviews for N285/ASME code components
    - Calculations Verification
    - Qualification Tests
  - Verifiers
  - Schedule

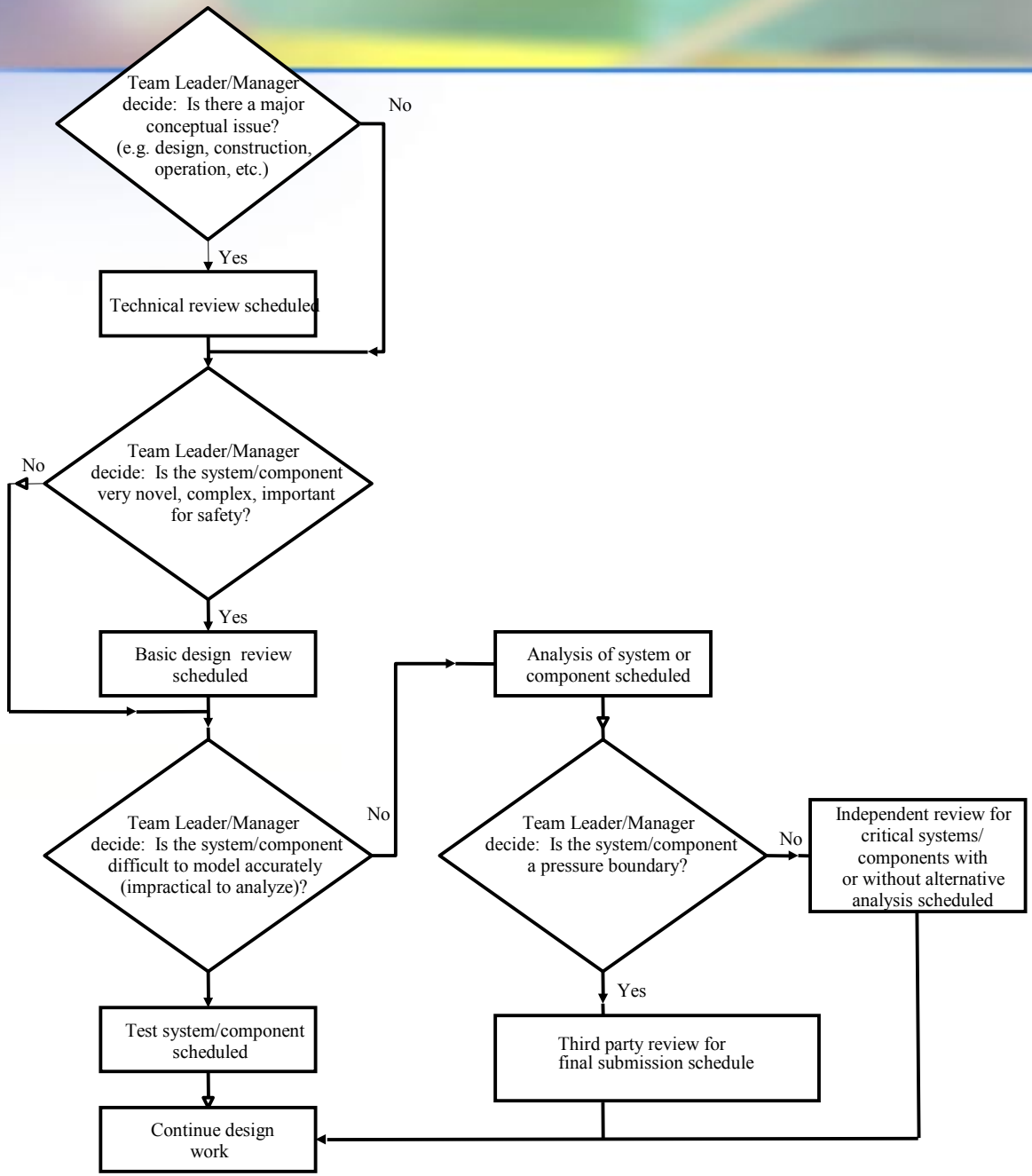
Design Verification Methods

Several design verification methods: depending on complexity, novelty, degree of standardization, state of the art, economics, and safety implications

- supervisory review (00-414.3/108-414.3.1)
- review and comment (00-531.4)
- checking technical calculations (00-433.1)
- review of design (stress) reports (00-531.6)
- reviews of seismic qualification (00-531.3) and other special reports
- design review/ technical review (00-531.2/108-531.2)
- design walk-throughs (00-531.7)
- qualification tests (Section 6 of N286.2-00)

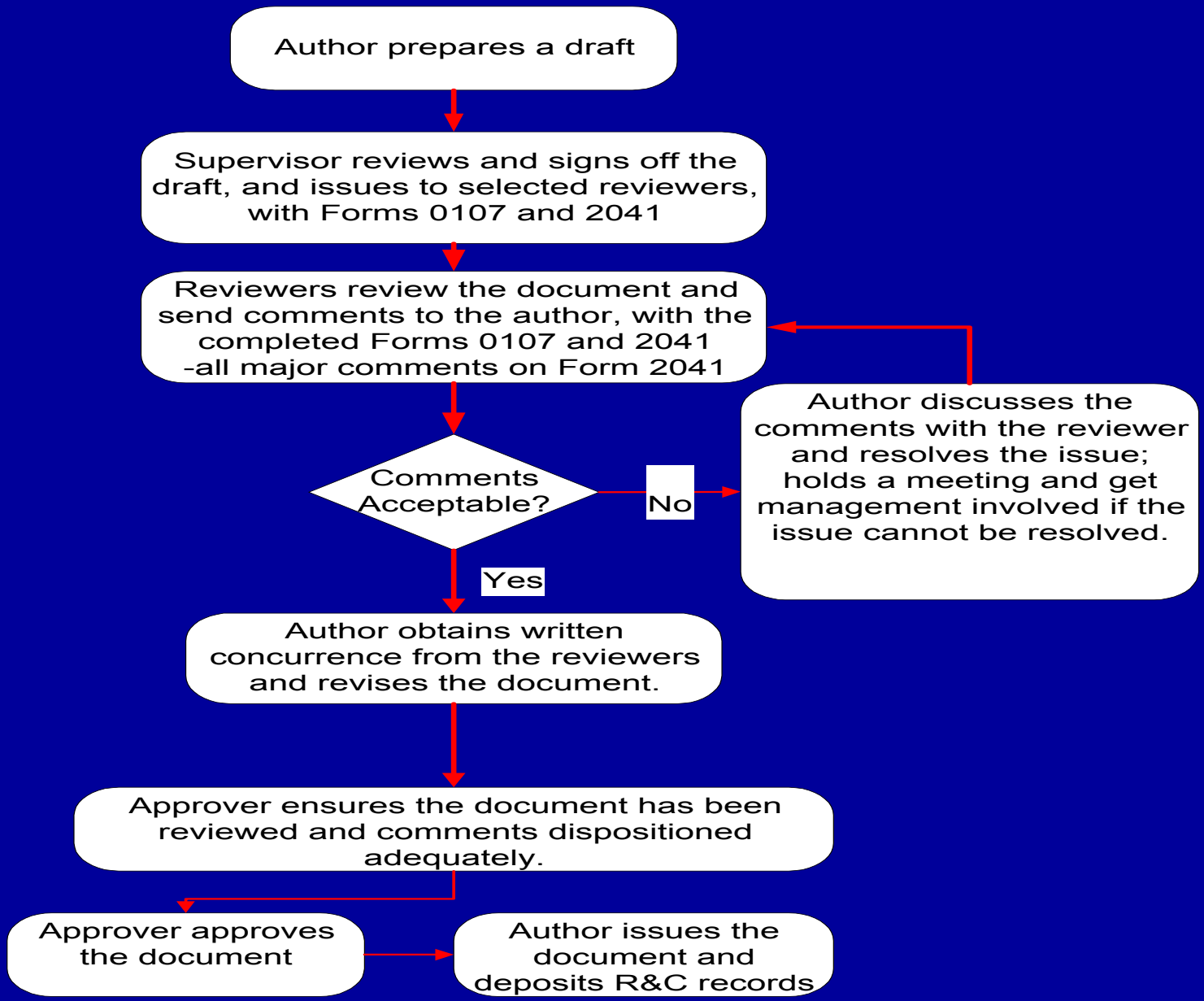


Design Verification Selection Process



Verification Method Selection Criteria

Document Review Process (Key Steps)



Design/Technical Review Process (Key steps)

(1) Before the design review:

Designers: (1) prepare a review package

Secretary: (2) Issues the package to the chair and other reviewers

Reviewers: (3) send their comments in writing to the designers

Designers: (4) provide written response

Secretary: (5) arranges a design review meeting

(2) During the design review:

Reviewers : (6) discuss with the designers and the resource persons and prepare a list of actions

(3) End of the design review

Designers: (7) provide written response to the actions

Chair: (8) prepares statement on design assessment

Secretary: (9) issues the design review report / action status report

Management (10) Keeps track of actions and closes all the actions

Chair: (11) Issues a design closure memo

Qualification Tests

- Qualification tests verify a design or a design feature of a system or a component by testing.
- Designers identify test requirements in a CVS or eqvt document. Test requirements include acceptance criteria.
- Test organizations perform tests and produce test documentation such as test plans, test procedures, test reports in accordance with their approved QA programs (which meet the requirements of Section 6 of N286.2-00).
- Where required, designers/QA staff participate in witnessing the tests and in the review of test documentation.

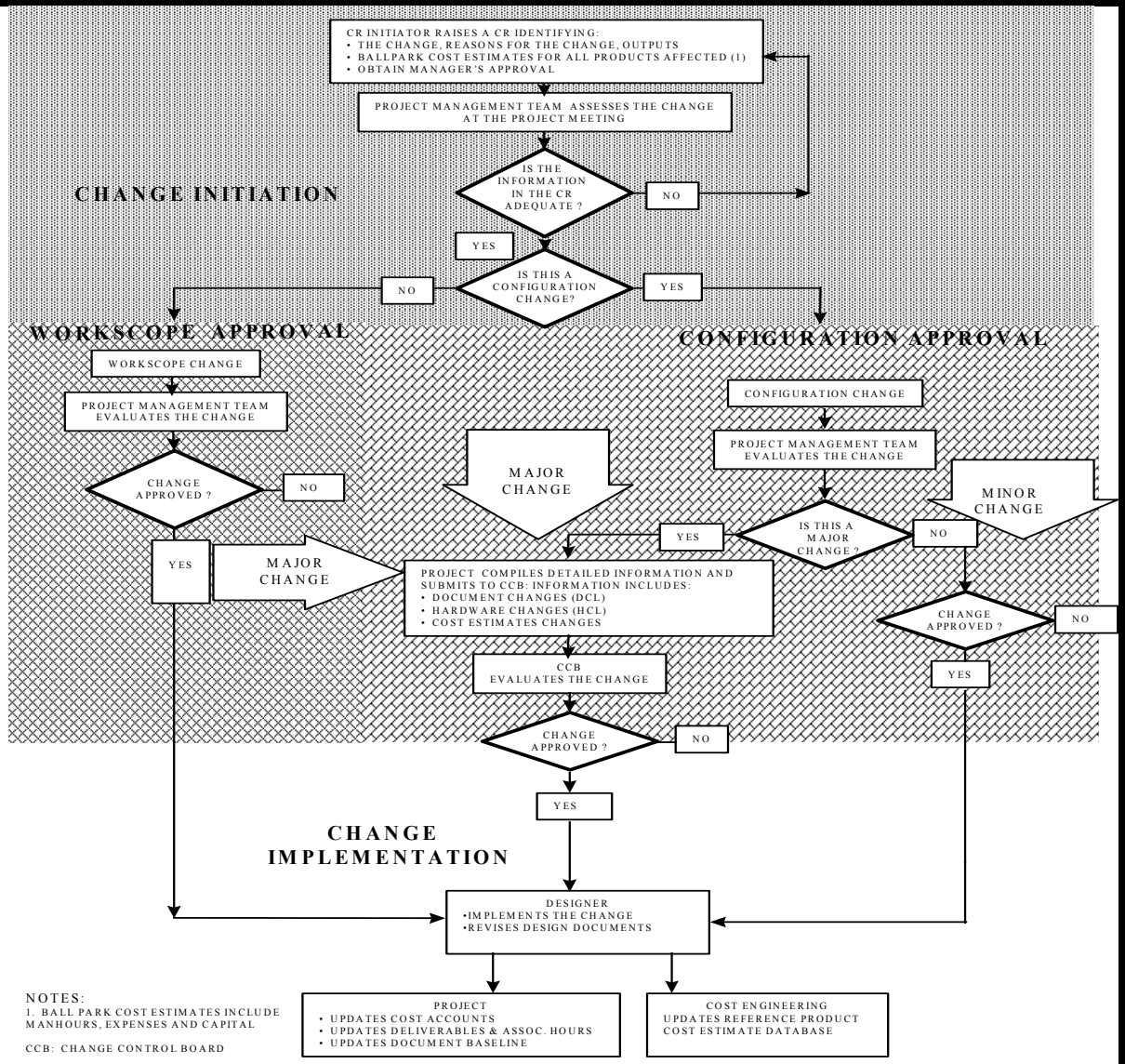
Design Authority

- **Corporate Procedure 00-591.1**
  - Defines Design Authority Function, Roles & Responsibilities, Delegation of Design Authority
  - Design Authority is retained by the Chief Engineer and defined as the execution of a series of functions that must be performed to ensure that AECL products and services meet the required safety, reliability & QA requirements.
    - Chairing of major design / peer reviews
    - Approving Design Verification Plans
    - Approving all major design changes (CCB)
    - Reviewing and resolving major technical and safety issues
  - Delegation to competent organization based on approved operating instructions (procedures)

Change Control

- **Procedures 00-680.1/00-681.1/108-681.1.1**
  - All changes to established / accepted configuration are controlled
  - Change control process include change initiation, administration, disposition, evaluation, approval and implementation
  - Changes are identified on a CR Sheet
  - Changes categorized as minor or major
  - Major changes reviewed and approved by the Change Control Board chaired by the Chief Engineer or designate
  - Minor changes handled by line units
  - Design is modified as per the approved CR and the affected documents and databases are revised and issued.

Change Process



CHANGE PROCESS

Audits

- **Corporate Procedure 00-904.1**
  - Applicable for internal & external QA audits
  - All technical groups at AECL are audited based on approved audit plans covering process, program & performance audits as well as vertical slice assessments
  - Procedure covers:
    - Auditor qualifications, responsibilities of auditee, auditor & lead auditor
      (Auditors assigned by SQRs in consultation with Corporate QA)
    - Auditing process & key activities, including audit checklists, meetings & reports
    - Audit findings, follow-up & closure
    - Audit findings categorization, trending & communication to senior management

Self- Assessment

- **Corporate Procedure 00-909.1**
  - Line organizations monitor their own compliance with the program and identify opportunities for improvements
  - Responsible manager identifies areas and processes for self-assessment
  - Self-Assessment reports are documented and actions monitored by the line units

Program Reviews

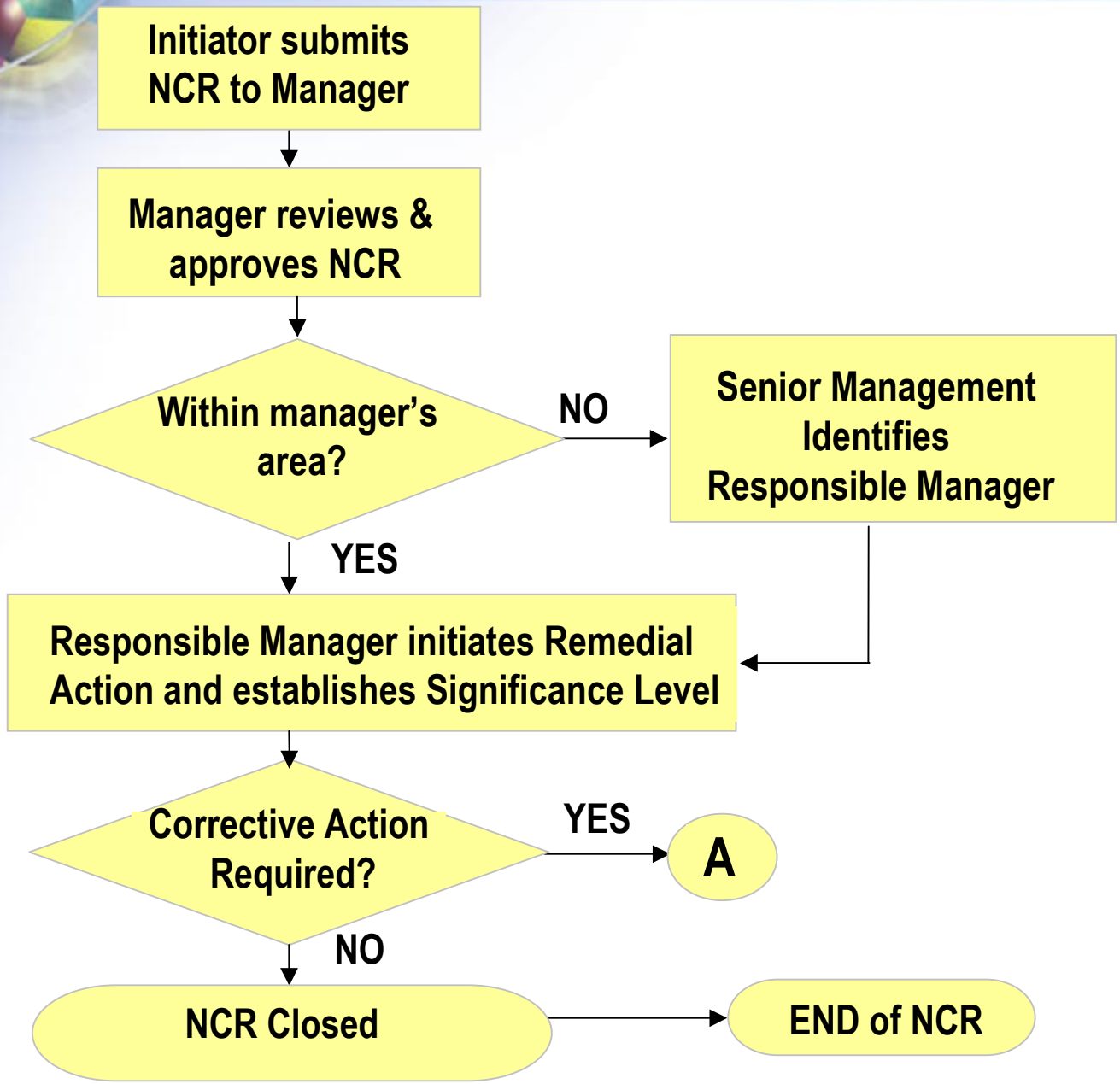
- **Corporate Procedure 00-905.1**
  - Covers annual program reviews and special examinations
  - Program Reviews based on audits, NCRs/CARS, customer feedback, staff feedback, self-assessments, changes in standards, special investigation, etc.
  - Assesses program suitability, adequacy & effectiveness
  - Responsibility rests with senior line management, supported by QA staff
  - Program Review reports approved by line management and CQO Office; actions follow up by the SQR and CQO office

Non-conformances & Corrective Action Program

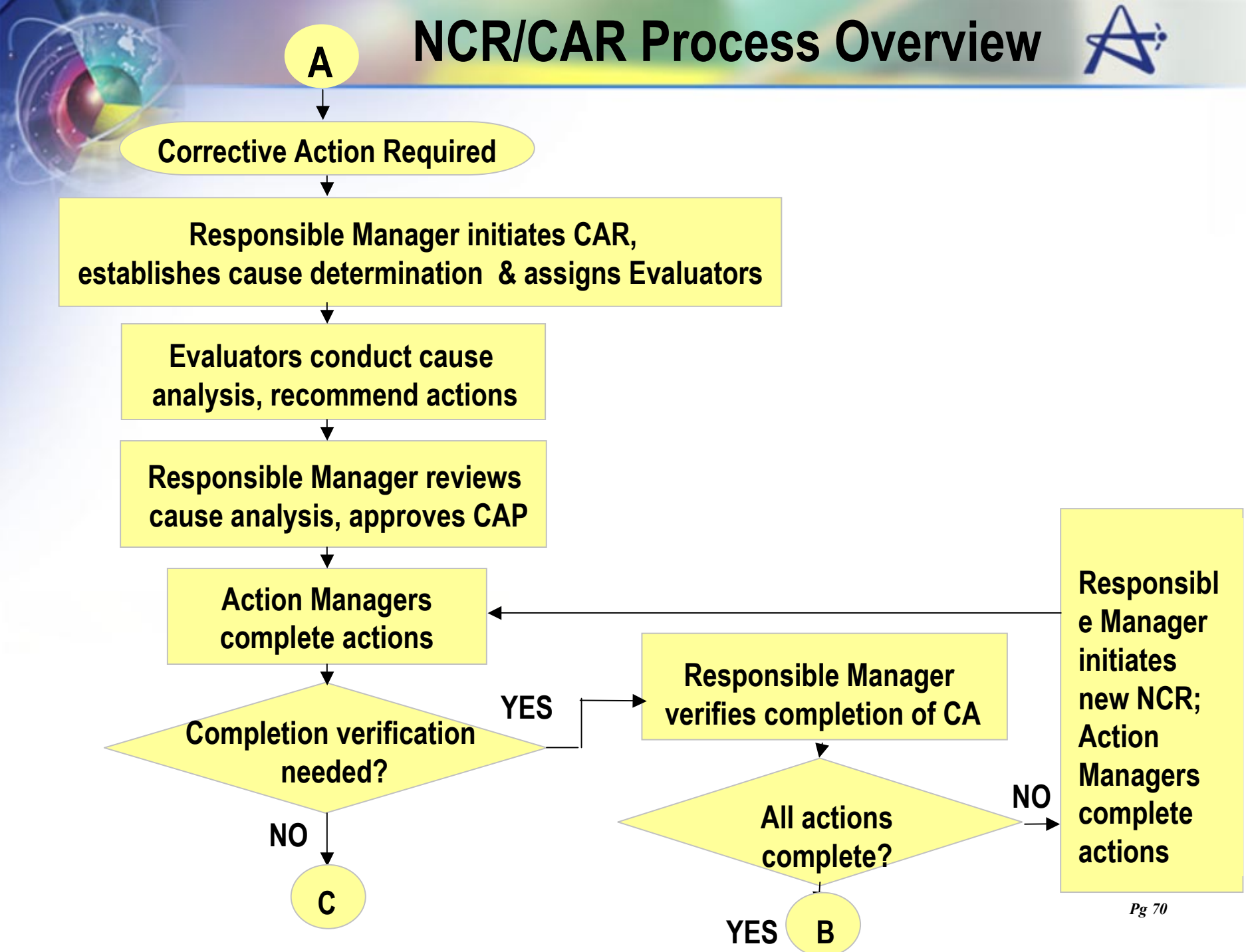
- **Corporate Procedure 00-906.1***
  - Non conformances are identified and analyzed
  - Non-conformances categorized into three categories
  - Category 1 relates to major safety issues
  - Apparent or root cause assessments are conducted depending on Significant Level of the nonconformance
  - Process details (see the flow chart)

*Note: In addition to this process, there are several other parallel processes (audits, design verification, change control etc) by which nonconformances/deficiencies are raised and resolved.

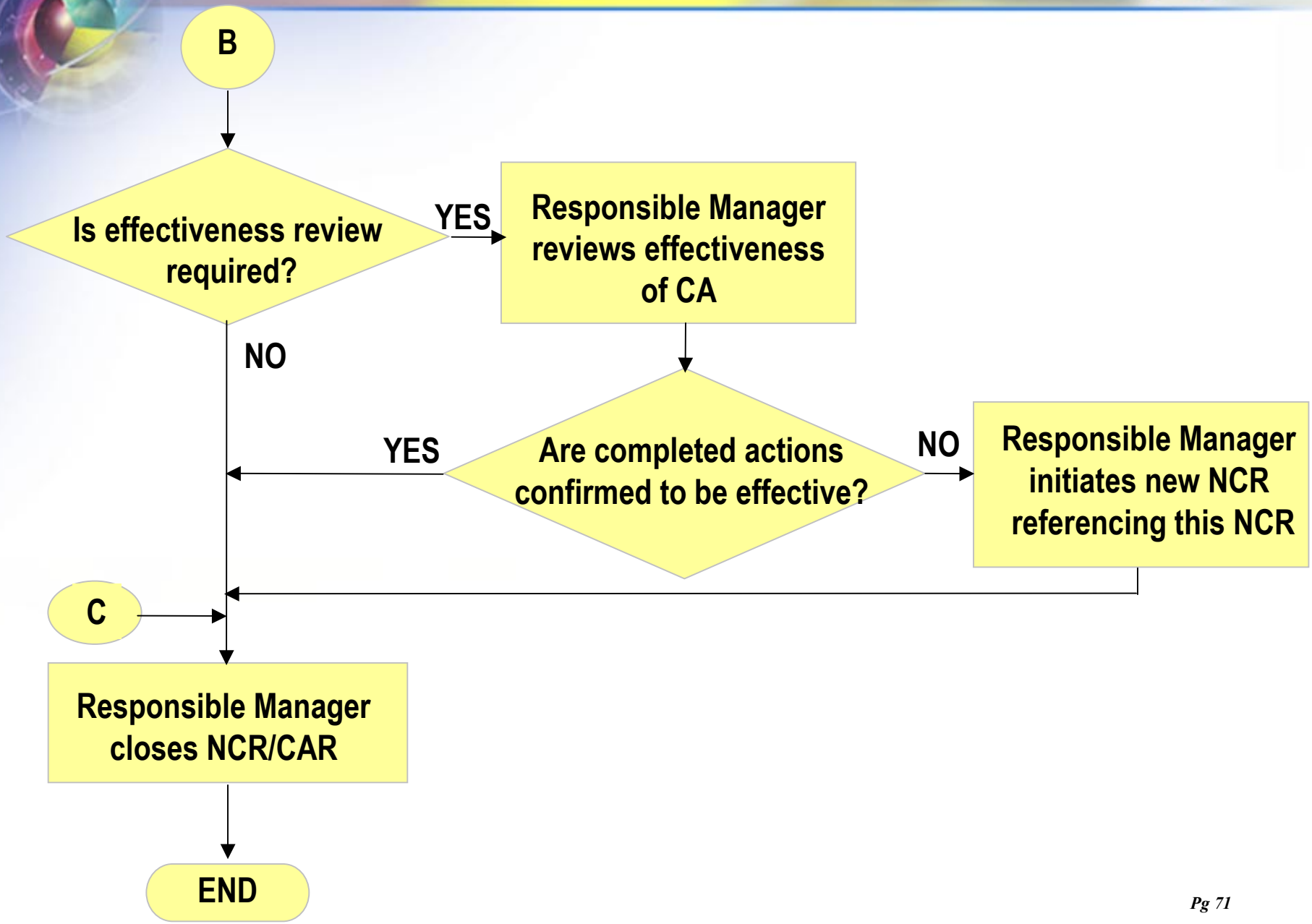
NCR/CAR Process Overview



NCR/CAR Process Overview



Conclusion of NCR/CAR Process



Significance Levels (Appendix B)

Level 1	A significant non-conformance that causes a reduction in margin of safety to the public or employees and/or which has adverse impact on safety or performance.
Level 2	A non-conformance which is not significant by itself but which may be the precursor to a more significant non-conformance.
Level 3	A minor non-conformance, which will help to identify by means of trend analysis, those areas that need more attention.

Judgment is used for near misses or potential non-conformances, which are entered at the same or one level down from what they would have been had they actually occurred.

Significance Level & Cause Determination Effort (Appendix C)

	Cause Determination Effort		
Significance	Root Cause	Apparent Cause	No Cause Determination
Level 1	**Normal**	X	X
Level 2	Allowed	**Normal**	X
Level 3	X	Allowed	**Normal**

List of Key Applicable Procedures

(For a complete list refer to the ACR QA Manual)

• Feedback for Design	00- 433.18 series/ 108-433.19
• Document Control	00- 414.3 / 108-414.3.1/108-414.3.3
• Work Control	00-601.1, 00-601.2, 00-602.1,108-602.1.1,108-651.1.1
• Change Control	00-681.1 / 108-681.1.1
• Feedback	00-433.18/108-433.19
• Design Authority Function	00-591.1
• Design Verification	00-531.1
– Document Review	00-531.4
– Design and Technical Review	00-531.2/108-531.2
– Technical Calculations/Analysis	00-433.1
• EQR	00-852.1
• Equivalency	00-933.4.2
• Personnel Qualification / Accountability	00-221.6, 00-226.1
• Quality Audits/Self Assessment/QA Monitoring	00- 904.1/00-909.1/108-923.1.1
• QA Program Reviews	00- 905.1
• Nonconformance/Corrective Action	00-906.1
• Formal Design Documents Manual	00-03000-MAN-001

Examples of ACR NCRs for 2003/ 2004

NCR/CAR#	NCR Title	Significance Level	Status
108-00130-NCR-001	Configuration Management gap between different ACR Engineering Disciplines involving different CAD tools.	1	Open
108-01917-NCR-001	Procedure 00-531.4 (Document Review & Comment) not being followed.	3	Closed
108-01917-NCR-002	Notes from a Meeting out for Review without being Marked as Draft (memo with limited distribution)	3	Closed
108-31113-NCR-001	Pressure Tube Rolled Joint development test schedule failure.	2	Open
108-37000-NCR-002	Late Delivery of Fuel for ZED-2 Facility.	2	Open

ACR Internal Audits (2003/ 2004)

Audit Scope	Organization	Schedule
Accountability, Personnel Qualifications & Training, Work Control, Verification, Testing, Feedback, Preparation of Design & CADDS Drawings	**ACR Product Development & CANDU Technology Development (Fuel & Physics)** Safety Engineering, Design Drafting, Fuel Design, Reactor Core Physics	April, 2003 (Complete)
Accountability, Personnel Qualifications & Training, Design Outputs/ Inputs, Work Control, Design Feedback, QA Program Definition, Design Verification, Document Control, Change Control, Interface Control, Non-conformances & Corrective Actions	**ACR Product Development** Process Systems, Reactor & Fuel Handling, Modules & Configuration, Civil & Layout, Instrument & Electrical, Computer Controls, ACR Project Control	Jan., 2004 (Complete)
Interfaces, Work Planning & Control, Control of Items, Processes and Practices, Verification, Non-conformances, Corrective and Preventive Actions, Document Control and Records	**Commercial Products & Field Services**	March, 2004 (Complete)
Interfaces, Work Planning and Control, Verification, Document Control, Control of Records, Non-conformance & Corrective Action	**CANDU Technology Development**	March, 2004

ACR QA Monitoring/ Self Assessment (2003/ 2004)

Work Process (Procedures/ OIs)	Schedule
Use of Software and Analysis File Archiving 00-452.2, 00-453.2, 00-552.1	April, 2003
Use of Experience & Change Control 00-433.18, 108-433.19**,** 108-433.19.1, 108-681.1.1, 00-681.1	June, 2003
Personnel Capability & Accountability 00-221.6, 00-226.1	August, 2003
Work Planning & Control 00-601.2, 108-602.1.1, 108-651.1.1	January, 2004
Document and Correspondence Control 108-414.3.1, 108-414.3.3, 00-401.6	January, 2004
Modularization related 108-403.1, 108-603.1.2, 108-531.6	February, 2004

Corporate Oversight Audits

- Director, Corporate QA Audits, reporting to the CQO, is responsible for identifying and performing Corporate Oversight Audits.
- These Oversight Audits ensure that the AECL projects/programs/nuclear facilities conform to the Corporate QA Programs and that the programs are effective.
- Activities are performed according to an Operational Plan
- The ultimate client of Oversight Audits is the President and CEO

Thank You