

International Federation of Consulting Engineers FIDIC



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Section 3 – Experience of executing Nuclear Power Plant construction projects outside Russia:

Adaptation of FIDIC forms of contract for NPP projects

17:10-17:25



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Table of contents

- I. Introduction
- II. Three FIDIC Forms
 - The Yellow Book
 - The Silver Book
 - The Gold Book
- III. NPPs – Distinctive Features
- IV. Adaptation of FIDIC Forms
- V. Conclusion



I. Introduction

No FIDIC form of construction contract has been drafted specifically for nuclear power ("NPP") projects .

Indeed there appears to exist no international standard form of construction contract for NPP projects.

However, three FIDIC forms of contract can serve as a starting point for preparing a contract for a NPP project.



II. Three FIDIC Forms

The three FIDIC forms are:

- Conditions of Contract of Plant and Design-Build ("**Yellow Book**")
- Conditions of Contract for EPC Turnkey Projects ("**Silver Book**")
- Conditions of Contract for Design, Build and Operate Projects ("**Gold Book**")

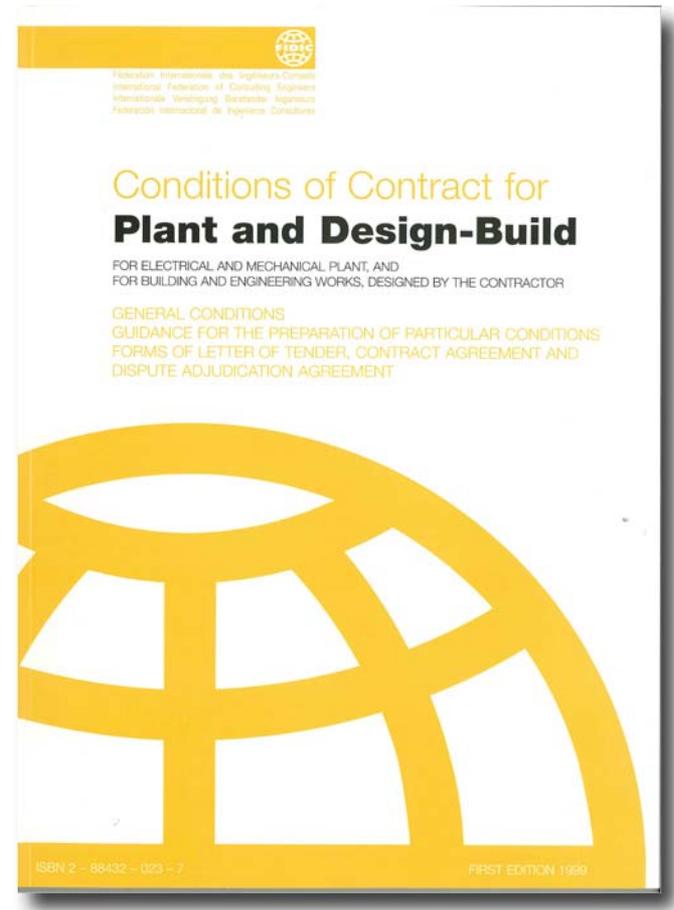
Which one to choose may depend on financing: whether by public or state-to-state funding, or private finance.



II. Three FIDIC Forms (cont'd)

The **Yellow Book** – Basic Features

"**Yellow Book**" (1999) – Conditions of Contract For Plant and Design-Build (for Electrical and Mechanical Works and for Building and Engineering Works Designed by the Contractor).



II. Three FIDIC Forms (cont'd)

The **Yellow Book** – Basic Features (cont'd)

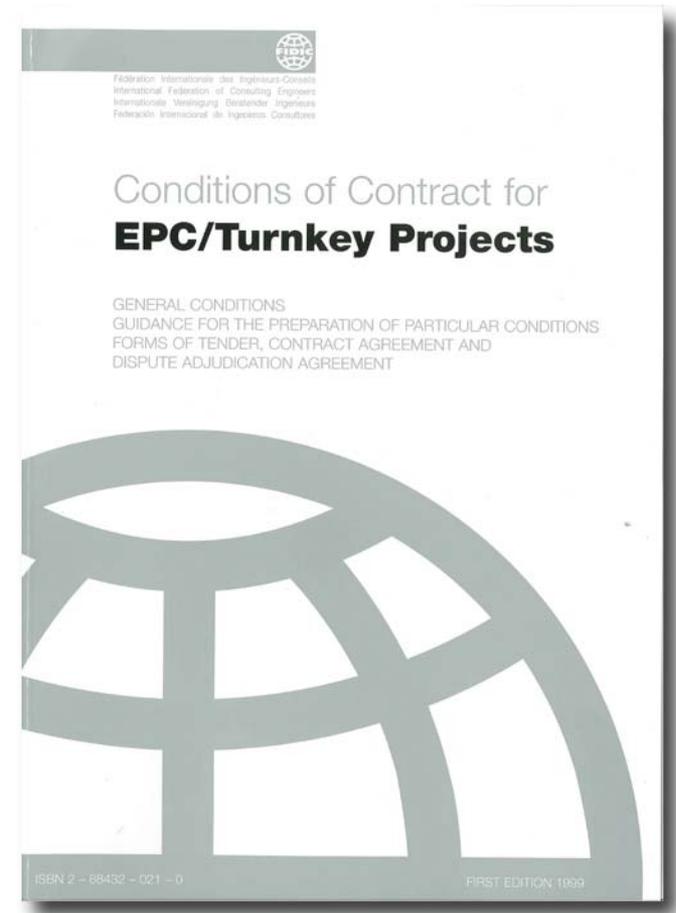
- Contractor mainly responsible for design
- Employer provides "Employer's Requirements" to which Contractor designs.
- Administration of Contract and supervision by Engineer.
- Lump sum "Contract Price" with schedule of payments.
- **Balanced / fair risk allocation.**



II. Three FIDIC Forms (cont'd)

The Silver (EPC/Turnkey) Book – Basic Features

"Silver Book" (1999) – Conditions of Contract for EPC/Turnkey Projects.



II. Three FIDIC Forms (cont'd)

The Silver (EPC/Turnkey) Book – Basic Features (cont'd)

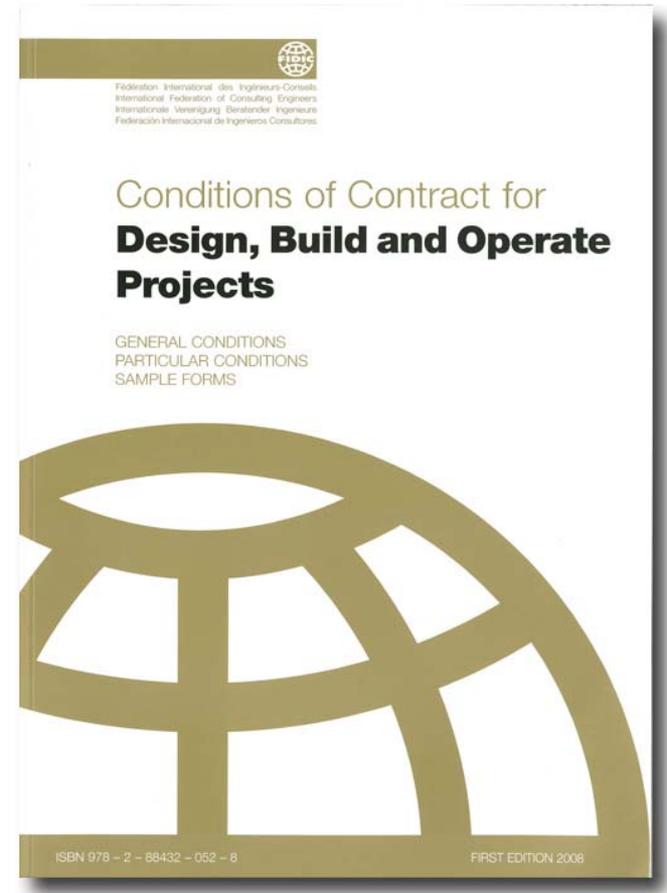
- Contractor solely responsible for design.
- Employer provides "Employer's Requirements" to which Contractor designs.
- Contractor carries out all engineering, procurement, construction.
- No Engineer – instead an Employer's Representative.
- Lump sum "Contract Price" with schedule of payments.
- **Contractor takes majority of risks**, Employer pays more to cover such risks.



II. Three FIDIC Forms (cont'd)

The **Gold** (Design, Build and Operate Projects) Book – Basic Features

"**Gold Book**" (2008) – Conditions of Contract for Design, Build and Operate Projects.



II. Three FIDIC Forms (cont'd)

The **Gold** (Design, Build and Operate Projects) Book – Basic Features (cont'd)

- The Contractor designs and builds the plant "Fit for Purpose"
- The Contractor then operates the plant under an operation license during which the plant must remain "Fit for Purpose"
- Upon completion, the Employer acquires ownership of the plant and thereafter pays an O&M service fee to of the Contractor
- Design, Build and Operate ("DBO") to be distinguished from Build-Own-Operate ("BOO") (as with Rosatom's Akkuyu NPP project in Turkey) where the Contractor owns the plant through the operation period.
- Balanced/fair risk allocation**

III. NPPs – Distinctive Features

- **Some fundamental differences from conventional projects:**
 - The need for Government approval, often at highest level,
 - There is a "third party" to the contract: the national nuclear regulator,
 - Safety and hence quality of the highest importance,
 - The Employer's role is greater as it will be the licensee and operator with exclusive nuclear liability,
 - Projects are bigger, technically much more complex, subject to very detailed regulation and take longer to complete.

IV. Adaptation of FIDIC Forms

- **Many additions must be made including as to:**
 - Licenseability and licensing of the NPP in a foreign country
 - Supply of nuclear fuel often under a separate contract with an affiliate of the contractor
 - Nuclear liability and indemnity and nuclear insurance
 - National codes and standards applicable to supply and construction of NPP
 - Detailed procedures for review and/or approval of the Contractor's design and other documentation (including licensing documentation)

IV. Adaptation of FIDIC Forms (cont'd)

- **Many additions must be made including as to (cont'd):**
 - Detailed quality assurance and quality control provisions with rights of inspection
 - Detailed pre-operational testing, commissioning, demonstration test run and provisional takeover provisions
 - Detailed technical guarantees for the NPP and extended guarantee periods for major components
 - Plant performance guarantees and availability guarantee after provisional take-over, enforced by liquidated damages
 - Detailed time schedules including provision for long-lead items

IV. Adaptation of FIDIC Forms (cont'd)

- **Many additions must be made including as to (cont'd):**
 - Responsibility for delay including delays caused by licensing authorities
 - Sanctions for unjustified delay:
 - Liquidated damages for ordinary delay
 - Penalty for prolonged delay
 - Rejection of plant
 - Changes in laws and regulations other than those on list of obviously foreseeable changes
 - Contractor's supplier license of patents and proprietary information to the Employer to operate and maintain the NPP
 - Long delivery time makes price escalation clause very important

IV. Adaptation of FIDIC Forms (cont'd)

- **Many additions must be made including as to** (cont'd):
 - Variations clause permitting changes for new developments in NPP technology and safety requirements
 - A reference NPP plant incorporating the same technology and design as the NPP should be identified
 - Obligation of confidentiality
 - Detailed regulation of subcontracting (or the “supply chain”)
 - Training of plant personnel
 - Availability of spare parts – supplier has duty over 20 years to notify the Employer if it proposes to discontinue manufacture

IV. Adaptation of FIDIC Forms (cont'd)

- **Clauses requiring little or no change:**
 - Contract payment
 - Termination by the Employer
 - Suspension and termination by Contractor
 - Force Majeure
 - Governing law – application of CISG 1980?
 - Claims, disputes and arbitration



V. Conclusion

Because of the unique features of an NPP, whichever FIDIC form is used, it will need to be modified very substantially.

Even after competitive bidding, the IAEA recommends that between the time the highest rank bidder is selected and a contract is signed 4 to 6 months be allowed for contract negotiations.

However, as I have said, a FIDIC form may, nevertheless, serve as a starting point for preparing a NPP contract.

Thank you

