Licensing issues for new build consortia

Aligning milestones and attracting investment

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Why is licensing crucial to attract new build investment?

Who are the nuclear consortia of the current renaissance?

• Increasingly **private**
• Increasingly use **industry equity** for seed funding (cf: debt/project finance availability)
• Massive investment required means no longer just utility driven
  - Increasingly **cross-disciplinary**
  - **Reactor vendors** driving consortia creation
  - Also **outbound** investment from **emerging** nuclear markets into older nuclear markets, for purpose of building expertise (eg, China into UK)
  - Massive investment means there is also a need to facilitate later investment by **non-nuclear** investors (eg, pension schemes) who can have less operational input
  - Also means nuclear is competing with classic infrastructure projects for traditionally conservative investors, so consortium agreements need to accommodate that lower risk appetite
• Competitive market for skills and resources forces **organic growth** of a “licensable entity”

**Licensing drives the size and shape of these consortia**

• Can be decisive in making project consortia investable
• How is this being managed?
Key project phases

**Initial decision**
- Incorporation and consortium agreements

**Siting**
- Select site
- Secure land option?
- Grid connection
- Exercise lease?
- EIA
- Early site works
- Site works

**Reactor design approval**
- Develop human resources
- Develop governance, financing and contract management procedures

**Construction**
- Contract placement
- Further components
- Long lead items

**Commissioning and operation**
- Fuel contracts
- Offtake contracts (including low-carbon regimes)
- NDF
- Waste contracts

**Decommissioning**
- Operational governance
- Decom’g contracts
- Site clean up

**Construction and operation**
- Construction
- Operation and maintenance
- Decommissioning

Additional notes:
- Technology, contracting and procurement
- Develop the operating entity
- Further components
- Procurement
- Select technology
- Offtake contracts (including low-carbon regimes)
- Grid connection
- Early site works
- Operation and maintenance
Key project investment milestones

- **In principle decision**
  - Notable investments: Develop the operating entity, Incorporation and consortium agreements

- **Siting**
  - Significant investments: Select site, EIA
  - Early site works

- **Reactor design approval**
  - Significant investments: Secure land option?
  - Grid connection
  - Exercise lease?

- **Construction**
  - Significant investments: NDF
  - Further components
  - Contract placement
  - Long lead items

- **Commissioning and operation**
  - Significant investments: Offtake contracts (including low-carbon regimes)
  - Fuel contracts
  - Operational governance

- **Decommissioning**
  - Significant investments: Waste contracts
  - Decommissioning contracts

**Technology, contracting and procurement**

- **Select technology**
- **Procurement**
- **Contract placement**
- **Further components**

**Site and grid**

- **Select site**
- **Secure land option?**
- **Grid connection**
- **Exercise lease?**

- **Site works**
- **EIA**

- **Construction**
- **Operation and maintenance**
- **Decommissioning**

**Notable investments**

- Develop the operating entity
- Incorporation and consortium agreements

**Significant investments**

- Select site
- Secure land option?
- Grid connection
- Exercise lease?
- Site works

**Very significant investments**

- Operational governance
- Offtake contracts (including low-carbon regimes)
- Fuel contracts
- Decommissioning contracts
- Waste contracts
- NDF
How do licensing issues affect commercial timelines?

<table>
<thead>
<tr>
<th>Stage</th>
<th>Consortium agreement considerations</th>
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| Securing a site and characterising its suitability | • Land option (and government strategic siting commitments)  
• Land purchase costs / Lease premiums and obligations  
• **Site characterisation** (including risk from works; grid connection; workforce; exit planning; legacy liability from site characterisation works?)  
• Making the site suitable (eg, legacy nuclear neighbour) contamination |
| Building a “licensable entity” | • Committing stable, consistent **expertise** (the right mix of investor expertise; exit restrictions; investor secondment obligations)  
• Ensuring **corporate governance** meets regulator’s standards (independence; stability; expertise – intelligent customer status) |
| Selecting and certifying a **reactor design** | • Technology competition processes  
• Justification  
• Design certification – costs; timing |
| Securing a reliable **supply chain** | • Ensuring **supply chain** is capable of meeting regulator expectations  
• Ensuring delivery (eg, early long-lead items) is committed to be made at the **right time**  
• Securing a main contractor, or means to coordinate **project delivery** |
| Developing relationships with stakeholders | • Ensuring enough stability, early design and planning for meaningful **community** engagement  
• Strategy for **engagement with regulators**  
• Making and supporting licence and permit **applications** (and defending legal challenges) |
The IAEA and nuclear licensing laws

**SF -1 Fundamental Safety Principles**
- Establishes the principles on which the Convention on Nuclear Safety is based

**Handbook on Nuclear Law**
- Recommendations regarding the basic characteristics of licensing laws:
  - Availability of licences
  - Application processes
  - Public participation
  - Criteria for issuance
  - Issuance and form of a licence
  - Suspension, modification or revocation
  - Review of licensing decisions
  - Inspection and enforcement measures
- Non-prescriptive as to process
Licensing requirements under international law: back to basics

Objectives in Article 1

- To achieve and maintain a high level of nuclear safety worldwide
- To establish defences in installations against radiological hazards
- To prevent and mitigate accidents with radiological consequences

Requirements

- **Article 7(2):** Countries must have a system of licensing, prohibit operation without a licence, and ensure inspection, assessment and enforcement
  - The permission principle and prime responsibility
- **Article 9:** Licensed operators must bear prime responsibility
- **Article 10:** Licensed operators must have policies prioritising safety
  - Qualifying as a licensable entity
- **Article 11:** Licensed operators must have sufficient financial and human resources to ensure safety
  - Substantive project requirements
- **Article 14:** Comprehensive safety assessments required before construction, commissioning, and through the project’s life
  - Safety assessments and siting
- **Article 17:** Siting and consultation processes
- **Article 18 - Design:** Construction and technology must include defence-in-depth, be proven or qualified by testing, and be reliable and stable.
- **Article 18 0 Operation :** Must accord with a safety case, use established procedures, constantly improve, and minimise waste.
Examples of licensing models: phases

Three phases
- Decision-in-principle
- Construction licence
- Operation licence

Five phases
- License to prepare site
- Construction licence
- Operation licence
- Decommission
- Abandon

Single licence with pre-requisites
- Justification
- Sites selected through planning regime
- Generic Design Assessment
- Single site licence
  (includes construction, operation and decommissioning requirements)
Aligning milestones and attracting investment

• **How do these licensing steps align with investment timelines?**
  - **Interdependencies** between licensing and investment milestones require **strategic planning** and careful management
  - Consortium agreements need to align with key licensing stages for many reasons:
    • **Certainty:** To harness the increased certainty from the grant of key approvals, as pre-conditions to major investment decisions/commitments
    • **Resources:** To ensure parties commit to provide the necessary resources to facilitate the completion of licensing phases – both expertise and finance
    • **Risk:** To ensure that liabilities and duties are not triggered until the consortium is adequately resourced and committed – and to create an exit plan
  - Licensing regimes need to be stable and predictable to make this possible
Commercial risks in phases of licensing

Three phases

Initial decision
Siting
Reactor design approval
Construction
Commissioning and operation
Decommissioning

Three phases

Decision-in-principle
Increased duties and risk
Construction licence
Operation licence

Increased Certainty
Licence to prepare site
Construction licence
Operation licence

Significant Certainty
Increased duties and risk

Very significant Certainty

Increased Certainty

Five phases

Justification
Sites selected through planning regime
Generic Design Assessment
Single site licence (includes decommissioning plan)

Single licence with pre-requisites

Increased Certainty

Increased duties and risk

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Dealing with licensing risk in Articles and Shareholder Agreements

What do vendor-driven, multi-disciplinary consortia mean for licensing and permitting timelines?

• **Alignment of key milestones**
  - Increases ability to identify obvious points to increase investment obligations in consortia agreements
  - Careful management needed – more licensing processes on the critical path

• **Parallel processes**: Vendors less willing to fund pre-licence design certification without a customer

• **Exit**: Unlike utilities, participant interest changes over the life of a project
  - Consortium agreement exit become important
  - Managing “licensable entity” status an important consideration

• **Diversity**: Impacts of difference between consortia members cannot be underestimated
  - Culture, background and area of discipline affect everything: project pace, risk appetite, communication, stakeholder engagement, etc
aligning investment decisions with licensing risk

initial decision

siting

reactor design

construction

commissioning and operation

decommissioning

three phases

decision-in-principle

increase certainty

increase certainty

increase duties and risk

very significant certainty

very significant certainty

financial investment decision

interim investment decision
When do consortium agreements provide for investment decisions?

**In principle decision**
- Notable investments
  - Develop the operating entity
  - Technology, contracting and procurement
  - Site and grid

**Siting**
- Significant investments
  - Select site
  - Secure land option
  - Grid connection

**Reactor design approval**
- Significant investments
  - Incorporation and consortium agreements
  - Procurement
  - Contract placement
  - Further components
  - Long lead items

**Construction**
- Significant investments
  - Develop human resources
  - Develop governance, financing and contract management

**Commissioning and operation**
- Significant investments
  - Fuel contracts
  - Offtake contracts (including low-carbon regimes)

**Decommissioning**
- Notable investments
  - Decommissioning contracts
  - Waste contracts

**Operational governance**
- \(\text{operational governance}\)

**FINANCIAL INVESTMENT DECISION**
- \(\text{financial investment decision}\)

**INTERIM INVESTMENT DECISION**
- \(\text{interim investment decision}\)

**CONSTRUCTION AND OPERATION**
- Construction

**DECOMMISSIONING**
- Decommissioning
UK example: Nuclear new build consents

Preparatory Phase

- Justification
  - Justification of Reactor Design

- Nuclear Site Licence
  - Generic Design Assessment
  - Nuclear site licence application
  - Funded Decommissioning Plan

- Planning
  - Strategic Siting Assessment
  - Environmental Impact Assessment
  - Development Consent Order (DCO) Application
  - Consultation with community

- Other Consents
  - Generation Licence
  - Preliminary site work permission

Construction Phase

- Satisfy ongoing licence condition hold-points
- Satisfy pre-operation DCO conditions
- Materials handling
- Grid Connection

Initial Investment Decision

Final Investment Decision

Preliminary funding and consortia creation
Dealing with licensing risk in Articles and Shareholder Agreements

Managing risks crystallised by licensing processes – example of contamination

• Strong trend for new build sites in mature markets to neighbour legacy sites
  - Reasons for original siting decisions tend to endure: eg, cooling water, seismic stability, visual impacts, transport
  - Existing grid
  - Workforce and skills
  - Government policy

• Presents new and interesting challenges
  - Risk of neighbours impacting on each other's safety cases (generating v generating/decommissioning)
  - Risk of legacy contamination on new build site
  - Competition for local resources: transport and access; workforce; grid capacity
  - Cumulative radiological dose impacts?

• What does a legacy nuclear neighbour mean for licensing and permitting timelines?
  - Legacy contamination liabilities:
    • Grant of new licence can immediately channel the legacy liability to the new operator
    • Need to ensure licence not granted until project definitely proceeding
Dealing with licensing risk in Articles and Shareholder Agreements

Engaging regulators to manage commercial risks in licensing timelines

• **Timing**
  - Increasing certainty and predictability (eg, UK planning reforms)
  - Holding consents with immediate implementation costs: for synchronisation with project investment milestones

• **Predictability**
  - Early engagement
  - Early design certification
  - Electricity markets

Harnessing political goodwill to facilitate licensing and permitting

• **Community engagement**: alignment of national and local processes to facilitate parallel regulatory processes
• Building the **supply chain**
• **International** relations

The future: Increasing interest from regulators and governments to identify future opportunities to improve coordination of licensing processes with investment and development processes.
CHAPTER 1. OBJECTIVES, DEFINITIONS AND SCOPE OF APPLICATION

ARTICLE 1. OBJECTIVES

The objectives of this Convention are:

(i) to achieve and maintain a high level of nuclear safety worldwide through the enhancement of national measures and international co-operation, including, where appropriate, safety-related technical co-operation;

(ii) to establish and maintain effective defences in nuclear installations against potential radiological hazards in order to protect individuals, society and the environment from harmful effects of ionizing radiation from such installations;

(iii) to prevent accidents with radiological consequences and to mitigate such consequences should they occur.
Thank you