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# Regulation of UK Nuclear New Build

## World Nuclear New Build Congress
## September 2014

**Mr Mark Foy**
**Deputy Chief Inspector**
**Director Civil Nuclear Reactor Programme**
**Office for Nuclear Regulation**

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# Scope

- ONR a Public Corporation
- New build major players
- UK Legislation
- UK Nuclear Safety
- Environment Agency
- Regulating new build
- Generic Design Assessment (GDA)
- Site Specific Assessment and Licensing
- New reactor construction

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# NII to ONR

## Aim

New sector-specific independent regulator, with a predominantly non-executive board, which

Reports to Ministers in respect of its regulatory functions

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## The Energy Act 2013

- The Act sets out a clear governance model for the statutory ONR
- Responsibility for five key areas: nuclear safety; nuclear security; nuclear safeguards; the transport of radioactive material by road, rail and inland waterway; and health and safety on nuclear sites.
- The Energy Act also ensures that the ONR has the financial and organisational flexibility required to meet its business needs on a sustainable basis.
- Consolidate the nuclear regulatory framework, improve the consistency of regulation and reduce interfaces for duty holders.

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# ONR 5 Year Strategy – Published for Consultation

Three key strategic themes:

- Influencing improvements in nuclear safety and security
- Achievement of our vision through ONR's people
- Inspiring a climate of stakeholder respect, trust and confidence.

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# ONR 5 Year Strategy

Influencing improvements in nuclear safety and security

Focus regulatory attention on the UK's nuclear priorities of:

- Hazard reduction and remediation at Sellafield;
- The nuclear new build programme, involving the assessment of safety cases for potential new nuclear power stations and their potential subsequent licensing, construction, operation;
- Assured regulation of the safety and security of the existing fleet of operating reactors, waste management and decommissioning, the nuclear defence platform and radioactive materials transport.
- Continue to facilitate improvements in the UK's emergency preparedness and response organisation

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# ONR Annual Plan 2014/15

- **Hazard reduction and remediation at Sellafield** – maximise opportunities for faster hazard reduction, new strategy, review programme structure.
- **Regulatory assurance** – Improve guidance and standards, review SAPs, programme of audit and review, demonstration of regulatory effectiveness
- **Generic Design Assessments and new build** – Stage 2 GDA for ABWR, restart AP1000, assess Horizon capability, determine HPC inspection/assessment regime
- **Continuous improvement throughout ONR's regulatory interventions** – Compliance, permissioning, international obligations, materials consolidation
- **Corporate** – Finance targets, income, operating model, efficiencies
- **Performance** - Inspection targets, reporting deadlines, critical posts

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# Programmes

- **Operational delivery programmes:**
  - **Civil Nuclear Reactors**
  - **Sellafield**
  - **Decommissioning Fuel and Waste**
  - **Defence**
  - **Civil Nuclear Security**
  - **Cross ONR**
- **Enabling programmes:**
  - **Regulatory Assurance**
  - **Corporate Services**

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# NEW BUILD REGULATION

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# Major Players

- **Government and Ministers** – Determination of the need, benefit versus risk/detriment, Department of Energy and Climate Change key in UK, promotes development of industry
- **Requesting Party** – Reactor Design/Technology
- **Site owners and prospective licensees**
- **Regulators** – ONR/EA/SEPA/NRW - Must be independent of the Government Department that is responsible for developing the industry
- **Many other stakeholder organisations**

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# Principle UK Legislation

- Health & Safety at Work Act 1974 – Primary H&S legisaltion
- Nuclear Installations Act 1965 (NIA65) – Nuclear Safety, Site Licence and Conditions
- Ionising Radiations Regulations 1999 – Provides for protection of workers from ionising radiation
- Radioactive Substances Act 1993 – Control of material and disposal of waste
- Environmental Permitting Regulations 2010 – Discharge Controls
- Nuclear Industries Security Regulations 2003
- Energy Act 2013 – Establish ONR as Public Corp April 14

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- Nuclear Installations Safety
- Civil Nuclear Security
- Radioactive materials Transport
- UK Safeguards Office
- ~ 450 Staff
- 6 Operational Programmes

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## UK Law – Nuclear Safety Specifics

UK's operates a licensing regime

Nuclear Installations Act 1965 (NIA65)

- Licensing of nuclear sites
- Empowers HSE to Grant Licences and attach Conditions

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# The Nuclear Site Licence

- Cannot install or operate a nuclear facility without a nuclear site licence
- Granted by ONR for indefinite period
- To corporate body only
- Not transferable
- Licence has 36 standard Conditions
- Conditions give ONR discrete powers to regulate activities on site
- Vary licence to exclude area:
  - No longer required
  - Demonstrate ‘no danger’

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# The safety case

- Having an adequate safety case is fundamental to ONR permitting activities on site
- Staged evolution aligned with life-cycle of the plant
- Demonstration that risks reduced as low as reasonably practicable.

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# Environment Agency

## Permitting

- Radioactive discharges
- Cooling water
- Abstraction
- Combustion plant
- Flood/Coastal risks
- Conventional waste
- Other discharges
- COMAH (with HSE)

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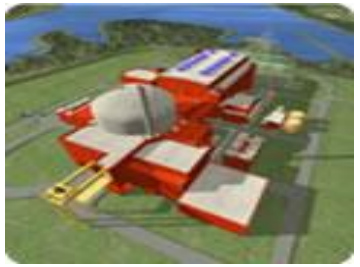
# Regulating New Nuclear Build

## Phase 1 - Generic Design Assessment

- Acceptability of Generic Design
- Acceptability of Generic Site

## Phase 2 – Site Licensing and Permitting



- Confirm that site is suitable
- Confirm that operator is capable an responsible
- Site *& Operator* Specific Design Acceptable, underpinned by GDA

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# Phase 1 - Generic Design Assessment

- Developed in 2006 – 2007 by the Office for Nuclear Regulation and the Environment Agency
- Aim: to assess new nuclear reactor designs in advance of any site-specific proposals – ID design changes before construction
- Assessment focus: generic reactor design + assumed UK-relevant generic site
- Assessment scope: nuclear safety, security and environmental impact
- Ultimate benefit: it helps to de-risk the site-specific licensing process
- Strategy: step-wise process with assessment getting increasingly detailed
- Reactors assessed to date: UK EPR™ and AP1000©

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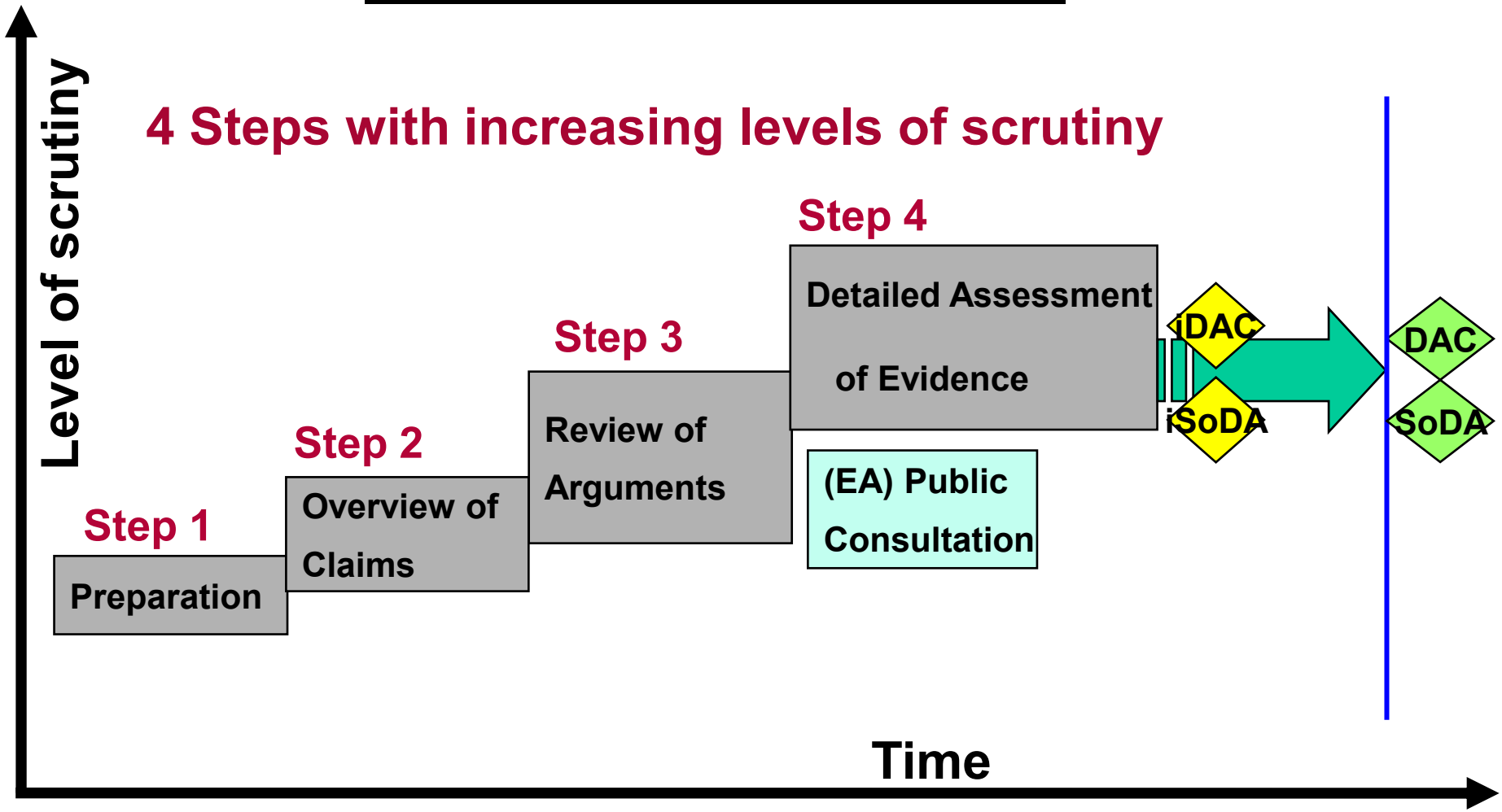
# Generic Design Assessment



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# GDA's Key Characteristics

- Engaging early – maximises influence
- Identify and resolve key issues before build – reducing cost and time risks
- Maximise value of pre-application – simplifying site specific phase & standardising plants
- Licensing / permitting programme in line with investment decisions – enabling not blocking
- Openness, transparency and public input – building public confidence
- UK regulators working together – clarifying expectations, providing consistency
- International cooperation – Between national regulators
- Full cost recovery

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# UK EPR™ & AP1000© GDAs in numbers

- > 7,000 documents submitted by designers
- 150 Technical support contracts
- ~50,000 days regulatory effort
- >1,000 technical meetings
- >1,000s of technical questions raised & responses reviewed
- 82 design changes from GDA on the UK EPR – primarily safety derived but with environmental benefits
- EA Consultation during GDA - ~1000 email invitations, ~20 local newspapers advertising, ~80 responses received
- ~£33M per reactor in regulatory charges

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# Phase 2 – Site Specific Licensing/Permitting

- Operators to carry forward GDA outcomes and resolve outstanding findings
- Use GDA in site-specific Licensing documents, regulators don't re-assess this area unless substantial changes introduced
- Applicant also submits
  - Site and operator specific changes
  - Design updates (time doesn't stand still)
- Licensee/Operator needs to engage with GDA requesting party to demonstrate knowledge and ownership of design
- Scopes operator capabilities to fulfil duties under Site Licence, LC arrangements in place, discharge legal duties.
- First nuclear site licence for NPP in 25 years granted to NNB GenCo Nov 2012

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# Nuclear Site Licence/New Reactor Construction

- Granting a NSL does not give permission for the start of nuclear safety related construction.
- That will require subsequent regulatory permission, via powers under the NSL, dependent on the site specific pre-construction safety case and NNB organisation development
- Potential Consents for:
  - First nuclear safety related concrete pour
  - First nuclear island concrete pour
  - First fuel on site
  - First criticality
  - Synchronise to grid
- Need for an approved Security Plan plus other permits required e.g. from EA etc

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## Site Specific safety Cases

- We expect to see a site specific pre-construction safety report (PCSR) - This should include GDA, site specific elements and any modifications to design.
- Normally we would expect to see a pre-commissioning safety report (PCmSR)
- And, of course, we expect to see a pre-operational safety case (POSR)

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# Regulator Focus during New Reactor Construction

Learning from experience from previous and current nuclear reactor construction identified areas of particular interest are:

- Supply chain
- Achieving right first time
- Minimise need for concessions
- Right people in the right jobs
- Level of independent challenge

# Who's involved?

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SOMERSET County Council

DEPARTMENT OF ENERGY & CLIMATE CHANGE

SDBC

nationalgrid
The power of action.

IPC Infrastructure Planning Commission

Wessex Water

Sedgemoor IN SOMERSET

marine management organisation

FOOD STANDARDS AGENCY

ofgem

WEST SOMERSET COUNCIL

DH Department of Health

defra
Department for Environment Food and Rural Affairs

Communities and Local Government

NATURAL ENGLAND

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# The Nuclear Regulators is:

- Independent of Government and Industry
- Providing robust, independent, technical expert scrutiny
- Acting in an Open and Transparent way
- Ensuring people, society and the environment are protected from the hazards of nuclear activity
- Enabling development of new nuclear, BUT it must be safe, secure and environmentally acceptable

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# THANK YOU FOR LISTENING

# QUESTIONS?