ONR Office for Nuclear Regulation

The Generic Design Assessment (GDA) Process

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The three elements of new build

Generic Design Assessment (GDA)	Nuclear Site Licensing	Construction
EDF/Areva's UK EPR™	HPC SZC	Hinkley Point C Sizewell C
Westinghouse's AP1000®	NU·GEN	Moorside
Hitachi-GE's UK ABWR	HORIZON NUCLEAR POWER	Wylfa Newydd Oldbury
General Nuclear System's UK HPR1000	BRB CGN edF ENERGY	Bradwell B

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What is GDA?

- GDA is only 1 of the 3 elements of Nuclear New Build → GDA / Licensing / Construction

- GDA is an upfront, step-wise assessment of a **generic** reactor design undertaken by joint Regulators (ONR / EA / NRW)

- Usually, does not consider the build location

- Does not consider the operating organisation

- Prior to investment decisions

- Aim and advantage is *identifying and resolving key issues and design changes long before build – reducing construction cost and time risks*

- Openness, transparency and public input – building public confidence

- GDA is not a formal regulatory / legislative requirement, but remains a Government expectation

GDA Process & Typical Timescales
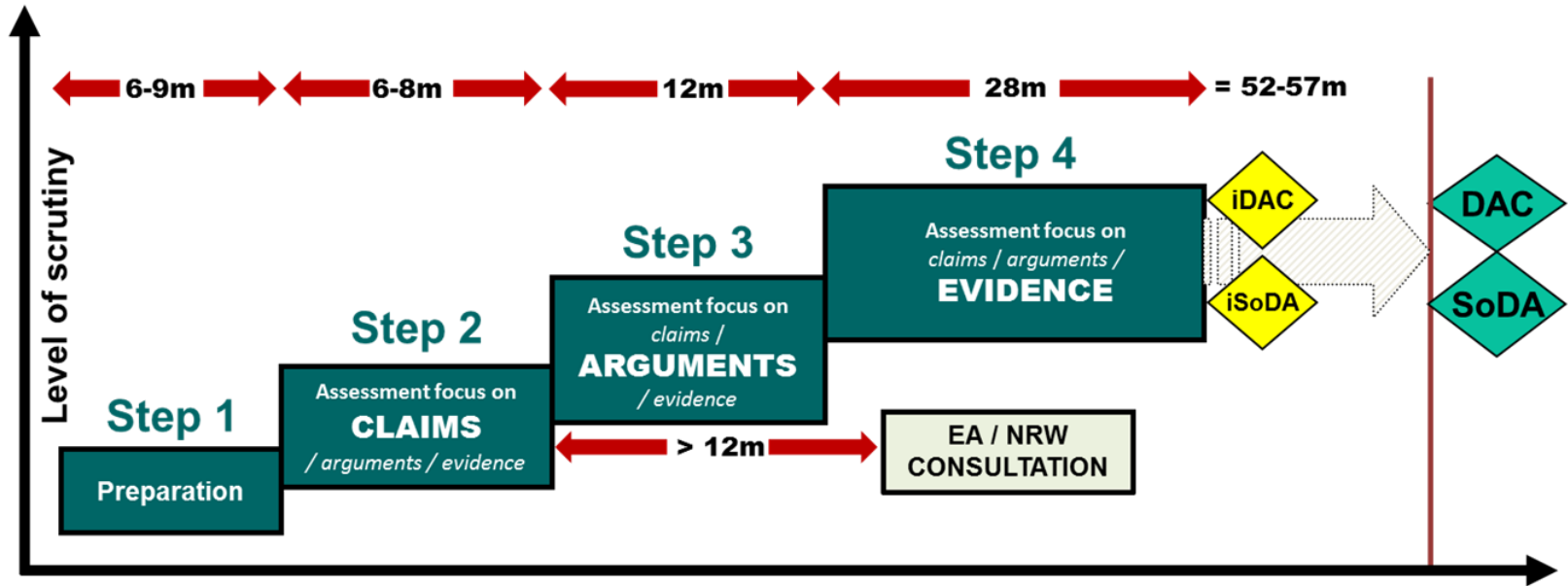
DAC: ONR's Design Acceptance Confirmation (iDAC: interim DAC)

SODA: EA/NRW's Statement of Design Acceptability (iSODA: interim SODA)

GDA Preliminaries:

- ONR has introduced the concept of 'preliminaries' to seek certain information and assurances from the GDA Requesting Party (RP) prior to the start of Step 1

- The precise nature of the information and assurances that ONR will seek from the RP will differ for each organisation

- Typical matters for discussion with the RP prior to Step 1:

  - Ownership & organisation structure of the RP;

  - RP decision making authority including budgetary control;

  - RP resourcing strategy for duration of GDA;

  - Clarity on the design being proposed and its ownership;

  - Assurance on the timely availability of all relevant information;

  - RP plans and proposals for a UK regulatory interface office;

  - Acknowledgement that the RP understands and will comply (so far as reasonably practicable) with the expectations set out in GDA guidance documents.

GDA Step 1: preparatory phase of the GDA process

- The key objective of Step 1 is for the Requesting Party to develop adequate project management arrangements and deploy sufficient technical resource to complete GDA

- No technical assessment

- The Requesting Party is required to develop a forward programme of work

- The output is a statement of readiness (from the regulators) for the Requesting Party to proceed to Step 2

- Typically takes 6-9 months to complete

GDA Step 2: high-level technical assessment of the fundamental aspects of the design ("claims / assertions")

- **Claims (or assertions)** → comprehensive set of statements that indicate why the facility is safe

- The key objective of Step 2 is to identify any fundamental safety, security or environmental issues that might prevent the issue of a DAC or SoDA

- The output is published ONR and EA Summary Reports and supporting technical Assessment Reports

- Typically takes 6-8 months to complete

GDA Step 3: a more detailed assessment of the design ("arguments / reasoning")

- **Arguments (or reasoning)** explain the approaches to satisfying the claims → for example methodologies used and assumptions made

- Increased regulatory scrutiny

- A key objective of Step 3 is to identify whether any significant design changes are required to meet UK legislative requirements

- The output is a published Summary Report from ONR

- Typically takes 12 months to complete

GDA Step 4: in-depth assessment of "evidence"

- **Evidence** → facts presented to support and form the basis of the argument or the safety claim → for example code analysis results, verification and validation reports, experimental results, etc.

- The objective of Step 4 is for the Regulators to complete a detailed assessment to enable ONR and EA to come to a judgment of whether a DAC and SoDA should be issued for the design

- Includes consultation by the Environment Agency on findings so far

- The output is a published Summary Report and supporting Assessment Reports in all technical areas

- Typically takes 28 months to complete

GDA: Potential Outcomes
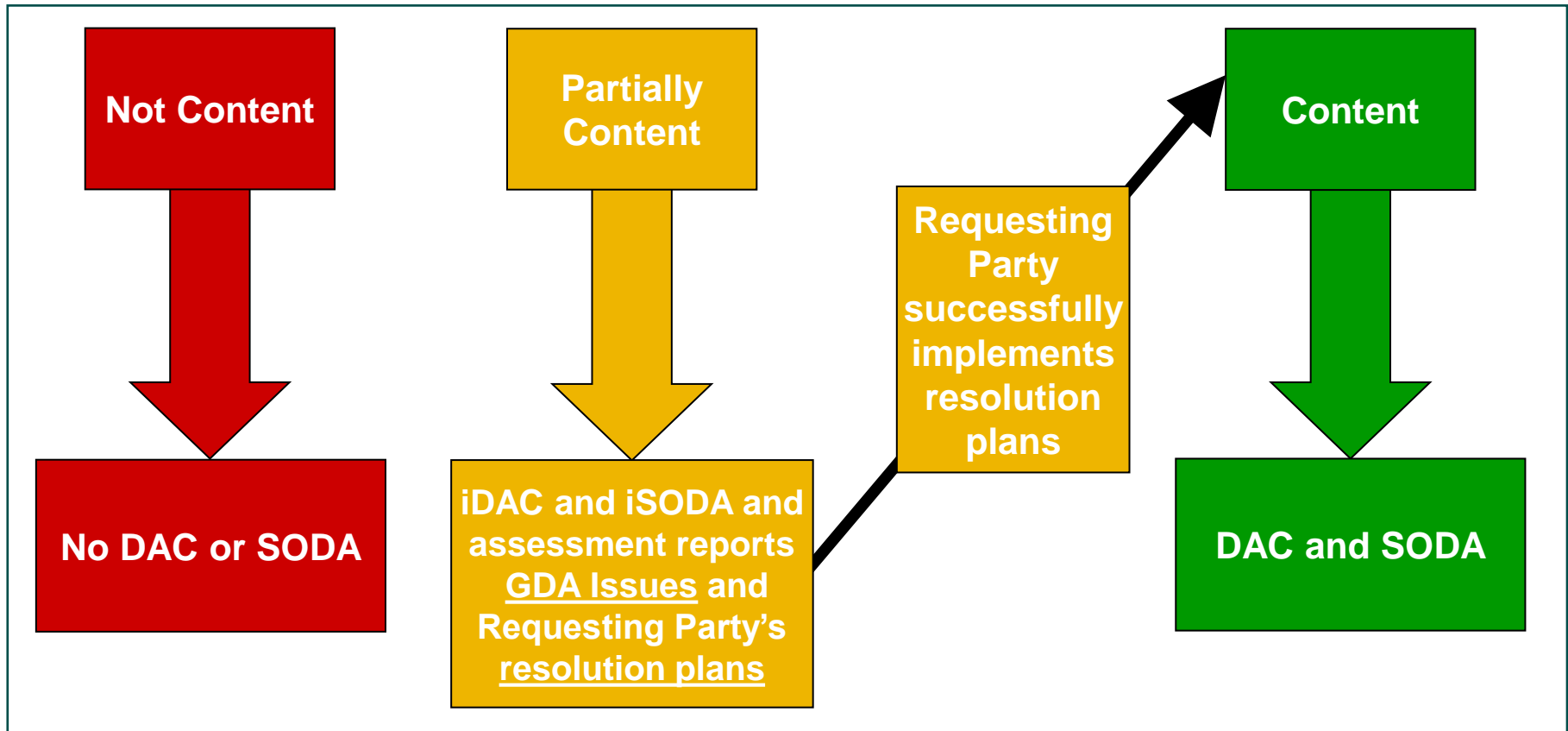
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Scope of GDA

Safety → Assessment by ONR

- 20 technical disciplines

- Assessment base is ALARP (risks As Low as Reasonably Practicable) and ONR's Safety Assessment Principles (SAPs)

Security → Assessment by ONR

- Assessment base is the Nuclear Industry Security Regulations (NISR) and ONR's Security Assessment Principles (SyAPs)

Environment → Assessment by the Environment Agency

- Assessment base is BAT (Best Available Techniques) and EA's Radioactive Substances Regulation Environmental Principles (REPs)

- Through life assessment, plus future disposability of wastes

Engagement in GDA: openness and transparency

- **Openness**:
  - Requesting Parties' websites with safety and environmental reports
  - Regulators' GDA website
  - Regulators' guidance published

- **Transparency**
  - Regulatory Observations (RO) and Regulatory Issues (RI) published
  - Regulators' assessment reports published
  - Progress reports

http://www.onr.org.uk/new-reactors/index.htm

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: ~1000 email invitations, ~20 local newspapers advertising, ~80 responses received

- ~£33M per reactor in regulatory charges
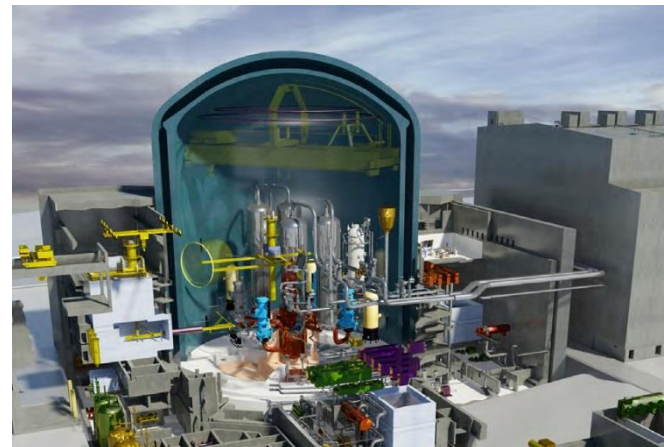
GDA Lessons Learned

- Integrated working between ONR (nuclear safety & security regulator) and EA/NRW (environmental regulators) is essential:

  - This manages conflicts of priority and provides clarity to the Requesting Party (RP). This has been a success over previous GDAs.

- There are not prescribed models for what RP's submissions should look like. However, formal regulatory tools used in GDA, ie, Regulatory Queries (RQs), Observations (ROs) and Issues (RIs), also help to provide guidance to the RP and to monitor and control their submissions.

- The concept of ALARP is not always well understood outside of the UK:

  - GDA provides a vehicle for the regulators to help the RPs understand the UK regulatory framework.

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THANK YOU

WWW.ONR.ORG.UK/NEW-REACTORS/INDEX.HTM