

QUOTATION

PROPOSAL FOR

OPENING UP THE

PRINCIPLES, PROCESSES AND DETAILED JUSTIFICATION

OF THE

GENERIC DESIGN ASSESSMENTS

FOR THE

PROPOSED AP1000 AND EPR NUCLEAR REACTOR PLANTS

CLIENT: *****

REF N° M1016-NDGSA

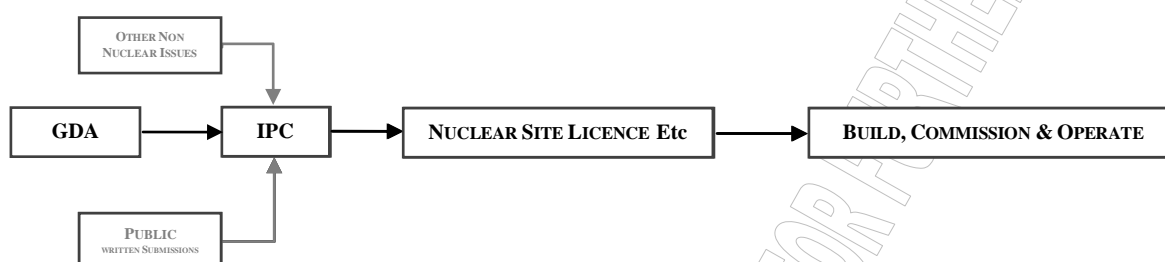
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NUCLEAR NEW-BUILD PROGRAMME - GENERIC DESIGN ASSESSMENT

TRANSPARENCY AND ACCOUNTABILITY OF THE GDA PROCESS

Much has been made of the so-called nuclear renaissance and, particularly, the future role of Generation III nuclear power plants in combating global warming. Indeed, it might be argued that the enthusiasm of the nuclear industry and politicians alike in promoting the resurrection of nuclear power as a key element in the UK energy policy has overshadowed, if not stunted, the reporting and public consultation on important aspects of nuclear safety, security, and environmental impact.

Government claims that the examination of the designs of these reactor plants by the regulators themselves,¹ via a series of Generic Design Assessments (GDAs), will provide sufficient safeguards to ensure that the Infrastructure Planning Commission (IPC)² is able to reach an informed and balanced decision in the national strategic interest.³ Thereafter and if granted planning permission to develop, the nuclear plants would be licensed on a site by site basis following established regulatory procedures.



Public consultation and input is excluded from the build, commission and operating⁴ stages; and there is virtually no public engagement during the nuclear site licensing and environmental certification phases that adhere to the established and generally closed legislative routes. In the planning and development process the only opportunity for the public to engage directly is via written submission to the IPC, but this assumes, albeit without much justification, that at the time when they are permitted to make submissions to the IPC, the public have themselves been sufficiently informed to arrive at meaningful judgments on important issues of public safety. Moreover, the IPC procedure, so far as the public are permitted to be involved, is not to permit open cross-examination of the safety and environment issues that may be in the forefront of public concern.

Thus the opportunity for the public to engage in a meaningful assessment of the introduction of these large, Generation III nuclear power plants is virtually confined to engagement and information dissemination during the progress of the various GDAs. It follows that crucial to a public understanding of the nuclear safety issues is the comprehensiveness and completeness of each GDA and how proficiently its findings have been reported into the public domain. The risks and uncertainties associated with this approach are severalfold, including:

- In the absence of the IPC including a detailed review of nuclear safety in its decision-making process (for which it allows a lean six months for public submissions on all topics) there will be considerable dependence on the final outcome and reporting⁵ of the GDA.
- In this way the GDA outcome enters into a legally binding process even though the GDA process itself does not appear to have any statutory foundation, instead it being defined, implemented and entirely judged by the particular regulator involved.^{1,6,7}

¹ Essentially, the HSE Nuclear Directorate and the Office of Civil Nuclear Security (OCNS), the Environment Agency and the Department of Transport's Radioactive Materials Transport Division (Dangerous Goods Division).

² Nuclear power plant developments are defined as *Nationally Significant Infrastructure Projects* (NSIPs) under the *Planning Act 2008* that also requires the government of the day to produce a National Policy Statements (NPSs)

³ Matters relating to nuclear safety, although the IPC might wish to consider these, remain outside the IPC's remit and the operation of any specific/individual nuclear installation will have to be issued with a Nuclear Site Licence under the Nuclear Installation Act 1965. Similarly, the nuclear process itself requires to satisfy the Justification of Practices Involving Ionising Radiation Regulations 2004 (Justification Regulations, in accordance with the EURATOM 37).

⁴ Other than the somewhat hands-off involvement of the site Stakeholder Groups.

⁵ The point here is that the Planning Act 2008 IPC process does not provide for an open public cross-examination of the developer's (EdF, ARIVA etc) nuclear safety case (and other topics) nor, apparently, does the IPC have any meaningful input into the various GDA processes to ensure that these have been undertaken at a sufficiently rigorous level and to a robust and credible evidence basis.

- The GDA process might become confused with the regulatory framework licensing new-build nuclear power plants, and it can do so in advance of, for example, the nuclear safety regulator NII undertaking the site- and operator-specific Nuclear Site and Licensee assessments required prior to nuclear activities commencing on any nuclear new-build site. Such engagement with the potential licensee before the site and licensee assessments have commenced could result in the NII being compromised by its previous (GDA) approval of a design feature or system function in advance of the formalised licensing process, particularly if undertakings given now are not to be binding at the site licensing stage.^{8,9}
- Example of the GDA reporting procedures is given by the combine of the HSE and Environment Agency in terms of quarterly progress reports¹⁰ which include the so-called GDA metrics,¹¹ by the now published NII thirty or so STEP 3 reports,¹² and, again for example, the HSE has convened a number of ‘stakeholder’ engagement meetings, conferences and other fora. Public interaction with these various modes of information exchange and accountability is mixed, although generally:
 - The *Quarterly Progress Reports* tend to be self-promoting, somewhat bland in detail and although comments are invited, any received do not seem to be openly published.
 - The ‘*metrics dashboards*’ show trends but do not in any way quantify what has been achieved and what remains outstanding, nor do these dashboards detail the design areas that have been ‘excluded’ from the GDA.
 - The *STEP 3 Reports* are technically detailed and jargon laden, most probably beyond any reasonable public comprehension but, even so, these tend to insufficiently comprehensive for expert analysis and assessment.

Although, or so it seems, the intent of the HSE (and other regulators) is to provide more openness and accountability the actual reporting and engagement outcomes have been mired in bureaucracy, versed in nuclear jabberwocky and beholden to the political diktat that, however and by whichever means, whether meaningfully or not, the public should be shown to have been consulted.

OBJECTIVE OF LARGE & ASSOCIATES ASSESSMENT OF THE GDA PROCESSES

Even at this late stage in the GDA deliberations it would be beneficial to open up the public reporting processes adopted by the regulators.

With this objective, the Large & Associates (L&A) work is to provide a background briefing for internal circulation (and possible publication) to interested parties identifying the primary nuclear safety and security issues presently being explored in the GDA processes being undertaken by the i) HSE NII, ii) OCNS, iii) Environment Agency and, to a lesser extent, by iv) the Radioactive Materials Division of the Department of Transport. Overall Large & Associates will include for the following options, each fully supported by citation of relevant sources and further reading:

- 1) **Review of the GDA Activities to Date:** A brief review of the reported activities (in the public domain) of each of the regulatory bodies undertaking the GDA (organisations i) to iv) above) as applied to the AP1000 and EPR Generation III nuclear plant designs.
- 2) **Identification of Appropriate Issues Registers:** For each of i) to iv) above, identification of issues for either inclusion and/or clarification in the *Quarterly Reports* with an option to negotiate these

⁶ In other words ‘*Quis custodiet ipsos custodes?*’

⁷ And, this in itself, raises uncertainty about the legal status of the *GDA Design Acceptance Confirmation*, which is to be issued by the same regulator carrying out the GDA.

⁸ An example of this is the exchanges, carried out under the GDA process, between the NII and EdF/AREVA relating to the Control & Instrumentation System, in which a Regulatory Issue was raised amongst three others, requiring the requesting party to respond in detail on a C&I issue - see *UK EPR Control and Instrumentation (C&I) Architecture Regulatory Issue RI-UKEPR-002* <http://www.hse.gov.uk/newreactors/ri-ukepr-002.pdf>

⁹ The point here is whether the IPC will feel compelled to place legally binding ‘*Grant Conditions*’ drawn from agreements reached between the regulator and on the nuclear new build developer during the GDA process. Much the same applies to the ‘*Exclusions*’ and ‘*Conditions*’ (ie exemptions in the GDA to be left over to the licensing stage) relating to both design and information aspects of the plant being granted by the NII during the GDA process.

¹⁰ For example, Generic Design Assessment, Progress Report, October 2009 to December 2009, HSE & EA - <http://www.hse.gov.uk/newreactors/reports/gda-q4-09.pdf>

¹¹ GDA Metrics, HSE - <http://www.hse.gov.uk/newreactors/gda-metrics.pdf>

¹² For the NII Step 3 is the ‘Overall Design Safety Review’ with example of a STEP 3 report being Step 3 Structural Integrity Assessment of the Westinghouse AP1000 Division 6 Assessment Report N° AR 09/013-P - <http://www.hse.gov.uk/newreactors/reports/gda-q4-09.pdf>

directly with each regulatory body as appropriate – for the NII Quarterly Reports concentrating on the ‘metrics’ appendix.

- 3) **STEP 3 Reports - Evaluation:** A compendium analysing each of the thirty or so NII STEP 3 reports, comprising a brief review of each report and identification of any outstanding issues. Similarly, a review of the equivalent STEP 3 reports issued by the other regulators ii) to iv) above.
- 4) **Ongoing Watching Brief:** Attending the relevant public and expert group meetings, from time to time as appropriate, compiling and issuing assessment of GDA issues as these might arise and, generally, preparing for the STEP 4 recommendations of the various regulatory bodies

LARGE & ASSOCIATES DELIVERABLES

TABLE 1 – PROGRESS AND REPORTING SCHEDULE (ILLUSTRATIVE OF THE HSE/NII COMPONENTS ONLY)

PROJECT STAGE	WEEK N ^o	REPORTING STAGE	FORMAT	NOTES
STAGE 1 GDA REVIEW	3	Briefing Note + Presentation	pdf report ppt slide presentation	Delivery 3 rd week June 2010
STAGE 2 ISSUES REGISTER	6	Report	pdf report	Includes final draft stage
STAGE 3 STEP 3 REPORTS	8	Report + Presentation	pdf report ppt slide presentation	Report includes final draft stage
STAGE 4	-	Ongoing	-	Sections to be agreed in advance

LARGE & ASSOCIATES

John Large¹³ and Large & Associates have already completed a number of projects relating specifically to the safety and vulnerabilities of Generation III nuclear power plants, particularly the EPR units presently under construction at Olkiluoto^{14,15} and Flamanville;^{16,17} the UK justification process;¹⁸ on the transportation risks of MOX fuels and plutonium at hearings of the United States Nuclear Regulatory Commission (NRC),¹⁹ to the Foreign and Defence Committee of the Government of New Zealand,²⁰ and Autorité de Sûreté Nucléaire (ASN).²¹

OUTLINE FEES & EXPENSES AND TERMS OF ENGAGEMENT

The fee structure is as follows with expenses and essential disbursements as incurred:

TABLE 2 – TENTATIVE FEE STRUCTURE

PROJECT STAGE	REPORTING STAGE	FEES	NOTES
ALL STAGES	Subject to Negotiation Prior to Contract	At Quantum to Agreed Rates Schedule	STAGES 3 & 4 are optional

- 13 John H Large is a Consulting Engineer, Chartered Engineer, Fellow of the Institution of Mechanical Engineers, Graduate Member of the Institution Civil Engineers, Member of the British Nuclear Society, Member of the Nuclear Institute and a Fellow of the Royal Society of Arts. From the late 1960s through to the late 1980s John Large was a full-time member of the academic research staff at Brunel University on behalf of the United Kingdom Atomic Energy Authority (UKAEA) and other government agencies undertaking research in the nuclear area.
- 14 *European Pressurised Reactor at Olkiluoto 3, Finland - Brief & Interim Review of the Porosity and Durability Properties of the In Situ Cast Concrete at the Olkiluoto EPR Construction Site*, June 2006 - <http://www.largeassociates.com/3149%20Olkiluoto/R3149-A1%20Final%20Issue.pdf>
- 15 *European Pressurised Reactor at Olkiluoto 3, Finland - Review of the Finnish Radiation & Nuclear Safety Authority (STUK) Assessment*, R3123-A2, July 2005 - <http://www.largeassociates.com/R3123-a2%20final%20Issue.pdf>
- 16 *Assessments of the Radiological Consequences of Releases from Existing and Proposed French EPR/PWR Nuclear Power Plants*, February 2007 - <http://www.largeassociates.com/3150%20Flamanville%3150-final-1.pdf>
- 17 *Additional Analysis and Comments on the Threat of Terrorist Attack to the Proposed 3rd Nuclear Power Plant at Flamanville, France*, States of Jersey, R3155-3, August 2006 - <http://www.largeassociates.com/3155%20Jersey/R3155-3.pdf> - Large J H. Marignac Y. Submission to the International Atomic Energy Agency - Convention on the Physical Protection of Nuclear Material (CPPNM) – IAEA InfCirc/274 & InfCirc/225/Rev.4 - IAEA Requirements on Design Basis Threat Assessment - *Non Compliance of Eurofab LTA shipment from US to France on UK Vessel: Security and Physical Protection Issues*, IAEA 20 September 2004 - <http://www.largeassociates.com/JointAssessmentIAEA.pdf>
- 18 *Justifying UK New Build Nuclear*, Call for Independent Inquiry - Technical Omissions in the Justification Process, Palace of Westminster, London 11 March 2010 - <http://www.largeassociates.com/3187%20Justification/S1387-A1.pdf>
- 19 *NRC Hearing Disposition of Surplus Weapons Plutonium Using Mixed Oxide Fuel*, US Nuclear Regulatory Commission Hearing, 2004 - <http://www.largeassociates.com/NRC1.pdf>
- 20 *Review of the Sea Transportation of Mixed Oxide Fuel: i) Transportation Risks and Hazards, ii) Physical and Dispersion Characteristics of MOX Fuel, iii) MOX Fuel, a UK Perspective*, Evidence to the New Zealand Government Foreign Affairs, Defence and Trade Select Committee, May 2001 - <http://www.largeassociates.com/R3063-MOX1.pdf>
- 21 *Joint Assessment, WISE-Paris/Large & Associates Safety and Security Concern / FS47, Plutonium in France, Safety and Security Concerns over the FS47 Transportation Cask*, Yves Marignac, Xavier Coeytaux, John H. Large, 21 September 2004, <http://www.largeassociates.com/JointAssessmentIAEA.pdf>

This quotation and offer remains open for 30 days from the closing date of 12 May 2010 – the contract, instruction and responsibility for payment of fees and charges will be with the instructing Client or its agents, as appropriate.

Terms are net monthly E&OE and interest is charged at 5% above Barclays Bank rate for accounts over 1 month outstanding - no further work will be undertaken on overdue projects until outstanding accounts are settled – a fully detailed breakdown of times and expenses is generated with each invoice, together with a statement of the carbon emissions generated by the L&A involvement with the project.

UK VAT is charged at the appropriate rate to UK-based clients, for consultancy services invoices to EU and overseas based clients are subject to 0% VAT rate.

Accounts to be rendered for electronic transfer payment via

<p>BANK ETR **_**_** ***** IBAN GB94 BARC **** * SWIFTBIC *****</p>

REFERENCES

An illustrative listing of clients is available at <http://www.largeassociates.com/clients.htm> and, if requested, referees drawn from past NGO clients will be provided.

CONFIDENTIALITY

Client confidentiality is paramount with all reported work, etc., being transferred to full copyright and intellectual ownership of the instructing Client (unless otherwise agreed) upon full and final settlement of the agreed invoice amounts.

PROFESSIONAL INDEMNITY COVER

Projects involving high hazardous products are not covered by professional indemnity insurance. If required, professional indemnity cover will be obtained for the requisite period into the future (usually the statute barred period) at an extra-over cost to the project.

FREEDOM OF INFORMATION ACT 2000

The information made available in this quotation Ref M1016-NDGSA is considered to be exempt from disclosure under the *Freedom of Information Act 2000*, it is to be treated as *Reserved Information* on the grounds for exemption that its disclosure to third parties would prejudice the commercial interests of Large & Associates and it must remain reserved information until the closure date specified previously or until the completion of the contract by whichever organisation/person has undertaken and completed the contract, whichever date is the later.

APPLICABILITY

This issue supersedes all earlier revisions and issue dates of Quotation Ref N° M1016-NDGSA.



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