

Scope of Work

Independent Audit and Assurance Services for the NDR 2.0 Programme

1 Introduction

The National Data Repository (NDR), under the aegis of the Directorate General of Hydrocarbons (DGH), is transitioning from its legacy on-premises infrastructure to a modern cloud platform. This cloud migration involves the massive-scale migration of India's national upstream E&P data assets, encompassing 125 TB of post-stack seismic, well data and other G&G data, and approximately 10 PB of pre-stack / raw seismic data, reports etc. Given the scale, national importance, and technical complexity of the NDR 2.0 programme, it is proposed to engage an Independent Audit and Assurance Partner to provide milestone-based, deliverables-driven oversight of the execution and transition to steady-state operations.

The proposed engagement will enable DGH to maintain independent governance oversight of the NDR 2.0 programme, ensure milestone acceptance decisions, and obtain structured risk visibility across data, cloud infrastructure, security, and operational readiness dimensions throughout the programme lifecycle.

Phase 1 of the programme, including data migration, User Acceptance Testing (UAT) and Go-Live, of NDR 2.0 has completed. The Contractor's review of Phase 1 shall accordingly be retrospective and evidence-based, conducted through review of the completed artefacts. Active oversight applies to the Phase 2 activities.

2 Objectives

1. **Provide Independent Oversight:** Deliver milestone-based, deliverables-driven audit and assurance of the NDR 2.0 Contractor's contractual outputs, without assuming any execution, configuration, or operational responsibility.
2. **Support DGH Governance Decisions:** Enable DGH to make informed, defensible, and evidence-based acceptance decisions at each programme milestone, through milestone acceptance advisory notes.
3. **Identify and Report Risks:** Provide structured risk visibility across data completeness, metadata integrity, cloud governance, security posture, cost management, and operational readiness dimensions, maintained in an Independent Risk Register issued to DGH at every milestone.
4. **Assure Data Migration Integrity:** Retrospectively review and validate the integrity, completeness, and traceability of Phase 1 data migration outputs.
5. **Security Posture Visibility:** Review security-relevant documentation and VAPT artefacts submitted under the NDR 2.0 contract to identify risks, gaps, and assumptions for DGH's consideration.
6. **Review UAT and Acceptance Evidence:** Independently review User Acceptance Testing artefacts, the Go-Live checklist, and acceptance documentation underpinning DGH's acceptance decisions.
7. **Cloud and Operational Governance Advisory:** Provide advisory observations on cloud architecture, storage governance, cost optimisation, vendor lock-in risk, disaster recovery (DR) setup, and operational readiness for transition to Operations & Maintenance (O&M).
8. **Verify Metadata Standardisation:** Independently verify and advise on the metadata standardisation activities being carried out by the Application Contractor under Phase 2, covering schema consistency, cataloguing completeness, and discoverability across all E&P data types.

9. **Verify Data Entitlements Framework:** Independently verify and advise on the data entitlements framework being implemented under Phase 2, covering role-based access design and auditability of access controls.
10. **Assess O&M Readiness:** Provide a structured, evidence-based O&M Handover Readiness Assessment at the conclusion of Phase 2, enabling DGH to make a defensible go/no-go decision on transitioning NDR 2.0 to steady-state operations. The assessment is advisory in nature and does not constitute a certification.
11. **Strengthen DGH's Oversight Capability:** Enhance DGH's ability to evaluate contractor performance, interpret independent assurance findings, and govern the NDR 2.0 programme through knowledge transfer and structured briefings delivered at each milestone.

3 Key Scope Components

3.1 Contract Governance, Retrospective Phase 1 Review, and UAT Advisory

The Contractor shall:

- Review the NDR 2.0 contracts and respective scopes of work, from a technical governance perspective, covering both the application stack vendor and the cloud service provider, to identify key milestones, deliverables, UAT obligations, and accountability boundaries between the two contractors.
- Map contractual milestones to the NDR 2.0 Contractor's actual execution and UAT evidence.
- Provide independent advisory observations on whether milestone deliverables and UAT results are consistent with contractual intent and DGH acceptance requirements.
- Identify gaps, risks, or ambiguities in acceptance criteria and bring them to DGH's attention.
- Provide milestone acceptance advisory notes to DGH on the NDR 2.0 Contractor's Phase 2 milestone deliverables, recommending acceptance, conditional acceptance, or rejection with reasons. These shall be issued through the Periodic Advisory Reports.
- Review available risk documentation submitted by vendors under their respective contracts, including transition risk logs, migration risk and mitigation plans, and maintenance risk documentation, to form the foundation for the maintenance of the Independent Risk Register.

3.2 Retrospective Technical Audit of Phase 1 Milestones and UAT

The Contractor shall:

- Conduct a retrospective audit of Phase 1 completion through document review. Gaps identified shall be entered into the Independent Risk Register, and not treated as re-execution triggers.

3.3 Architecture, Migration Strategy and Cloud Governance Advisory

The Contractor shall:

- Review the NDR 2.0 target architecture documentation from sustainability, scalability, operability, and governance perspectives.
- Review the migration approach, sequencing, assumptions, and dependencies adopted by the NDR 2.0 Contractor.
- Identify architectural risks related to cloud cost management, scalability, performance, security posture, and vendor lock-in.

- Review cloud governance and reporting mechanisms related to cloud infrastructure consumption, and identify potential actions for DGH to improve visibility and control of cloud costs.
- Review the data entitlement approach and implementation, covering role-based access controls on the cloud platform; entitlement workflows including provisioning, modification, and revocation; and audit log configuration for access events, from governance, regulatory compliance, and audit-readiness perspectives.
- The findings of this Section shall be reported through the Cloud Architecture, Cost and Governance Advisory Report.

3.4 Data and Metadata Assurance Advisory

The Contractor shall:

- Review source system inventories, extraction artefacts, migration evidence, and data loading and validation artefacts produced prior to Go-Live.
- Review approaches for data completeness, integrity, reconciliation, and traceability.
- Verify and advise on the active metadata standardisation work being carried out under Phase 2: review DGH's metadata schema definitions, assess implementation by the Application Contractor for consistency across multiple data types and document datasets, and advise on naming conventions, cataloguing completeness, and long-term metadata governance.
- Review integrity documentation across seismic, well, log, gravity/magnetic, and document datasets.
- Identify data-related risks, verify their inclusion in the NDR 2.0 Contractor's project risk register, and enter them into the Independent Risk Register.

3.5 Security Posture Visibility and Risk Assurance

The Contractor shall:

- Conduct a retrospective review of completed VAPT artefacts, CERT-In / STQC device certifications, and security compliance documentation submitted under the NDR 2.0 contracts. The review shall identify whether all observations were closed and remediated within contractual timelines, and whether any residual security risks require DGH's attention prior to O&M handover.
- Identify security-related risks, gaps, and assumptions for DGH's consideration.

3.6 Operational Readiness and O&M Handover Advisory

The Contractor shall:

- Review operational readiness and handover documentation submitted under the NDR 2.0 contract.
- Review the Disaster Recovery setup and configuration, covering DR architecture and replication configuration, compliance with the contractual provisions, and verification of complete PDC data replication at the SDC site, from governance, operational readiness, and audit-readiness perspectives. Findings shall be entered into the Independent Risk Register. This review shall be reported at M2, so that findings can be remediated before the O&M handover decision at M3.
- Review operational reporting artefacts supporting early operational governance.
- Identify operational, architectural, and cost-related risks, and enter them into the Independent Risk Register.

3.7 Risk Management and Independent Advisory Reporting

The Contractor shall:

- Maintain an independent risk register covering technical, data, metadata, cloud governance, security, cost, and sustainability risks identified through its audit activities.
- Submit the Independent Risk Register to DGH at each milestone, a First Issue at M1, an Updated Issue at M2, and a Consolidated Issue at M3, so that DGH has continuous risk visibility throughout the engagement.
- Provide periodic advisory reports to DGH at agreed milestones and during Phase 2 oversight.
- Conduct structured knowledge-sharing sessions for DGH teams, aligned to key programme milestones and audit findings, to strengthen DGH's long-term oversight capability. A session shall be conducted at each milestone (M1, M2 and M3), with the consolidated knowledge-transfer programme concluding by Day 180.

The structured knowledge-sharing sessions shall be delivered through physical classroom training at DGH / NDR premises or through interactive online sessions. All training materials, recordings, and documentation shall be handed over to DGH as a final deliverable.

4 Deliverables

The Contractor shall provide the following advisory deliverables, all of which shall be vendor-neutral and suitable for audit, vigilance, and regulatory scrutiny. Clear traceability shall be maintained between observations, identified risks, and advisory recommendations. Completion of each deliverable is defined as the submission of a final, evidence-based report acceptable to DGH. The timings below are calendar days from the date of issuance of the Letter of Award (LoA).

Sl.	Deliverable	Milestone Alignment	Timing
D1	Engagement and Communication Plan	M0 – Mobilization	Within 2 weeks of LoA
D2	Phase 1 Retrospective Assurance Report (covering: migration completion evidence, cloud infrastructure, UAT and acceptance evidence review, Go-Live checklist)	M1 – Phase 1 Retrospective Assurance	Day 15 to Day 60
D3	Phase 1 VAPT and Security Compliance Review Note		Day 15 to Day 60
D4	Cloud Architecture, Cost and Governance Advisory Report covering target architecture, migration approach, cloud cost management, scalability, performance, and vendor lock-in risk (retrospective review)		Day 15 to Day 60
D5	Independent Risk Register: First Issue		Day 15 to Day 60
D6	Metadata Standardisation Verification and Advisory Report	M2 – Metadata Standardisation and Entitlements	Day 61 to Day 120
D7	Data Entitlements Framework Review and Advisory Report		Day 61 to Day 120
D8	DR Setup and Configuration Review Note		Day 61 to Day 120
D9	Independent Risk Register: Second Issue		Day 61 to Day 120
D10	O&M Handover Readiness Assessment	M3 – O&M Handover Readiness	Day 121 to Day 180
D11	Knowledge Transfer covering cloud governance, metadata governance, entitlements, and risk register handover (one	M3 (sessions at M1, M2, M3)	Day 121 to Day 180

Sl.	Deliverable	Milestone Alignment	Timing
	week at NDR/DGH premises). A structured session shall be conducted at each milestone (M1, M2 and M3), with the consolidated programme to conclude by Day 180.		
D12	Consolidated Independent Risk Register	M3	Day 121 to Day 180
D13	Periodic Advisory Reports, including milestone acceptance advisory notes on the NDR 2.0 Contractor's Phase 2 deliverables	All Milestones	Last working day of each 30-day period
D14	Final Advisory and Readiness Summary	End of Engagement	Final version by Day 180

5 Quality Assurance and Oversight Principles

The Contractor shall ensure:

- Strict separation between independent oversight and any execution, configuration, or operational responsibilities at all times.
- All audit outputs are derived directly from the NDR 2.0 Contractor's contractual deliverables, as documented in an agreed Milestone-Deliverable Mapping Register to be finalised at mobilisation.
- All findings, risks, and recommendations are traceable to specific NDR 2.0 Contractor deliverables and DGH contractual requirements.
- One formal review cycle per NDR 2.0 Contractor milestone deliverable is included within the fixed-price scope.
- Periodic progress and status reporting to DGH at agreed milestones and review meetings.

6 Support and Maintenance

The Contractor shall:

- Provide audit, advisory, and verification services for the duration of the contract period of six (6) months from LoA, covering retrospective assurance of Phase 1 completion artefacts and active oversight of Phase 2 activities comprising metadata standardisation, the data entitlements framework, and O&M handover readiness.
- Respond to DGH queries and clarification requests within five (5) business days of receipt.
- Update the Consolidated Independent Risk Register on a periodic basis aligned to agreed reporting cycles.
- Support DGH in any re-review of revised NDR 2.0 Contractor deliverables, subject to agreed change control and applicable rates.

7 Compliance and Confidentiality

The Contractor shall:

- Adhere to applicable Government of India IT and data governance policies.
- Ensure confidentiality of all programme data, artefacts, and audit findings accessed during the engagement.
- Maintain secure audit trails and logging mechanisms for all review activities.

- Execute a Non-Disclosure Agreement (NDA) with DGH prior to commencement of audit activities.
- Not share any programme information, deliverables, or audit outputs with any third party without the prior written consent of DGH.

8 Duration of Contract

The duration of the contract is 180 calendar days from the date of issuance of the Letter of Award (LoA). The contract may be extended for a further period of 90 calendar days on mutual agreement and subject to satisfactory performance. The contract period does not include the mobilization period.

For the purpose of this contract, “calendar days” means consecutive days including weekends and public holidays.

The Contractor shall commence the Mobilization Phase immediately upon the issuance of the LoA. The Project Kick-off Meeting shall be held in accordance with Clause 9.1. The mobilization period shall conclude within fourteen (14) days of the LoA, by which time the Contractor must have:

1. Stationed the Project Manager at the designated NDR Office.
2. Submitted the final Engagement and Communication Plan.
3. Finalised the Milestone-Deliverable Mapping Register.

Liquidated Damages (LD): In the event of the Contractor’s default in timely mobilization and/or completion of work or submission of deliverables within the stipulated periods, the Contractor shall be liable to pay liquidated damages at the rate of 0.5% of the Total Contract Value (excluding GST) per 7 calendar days of delay or part thereof, reckoned from the date after the expiry of the scheduled period until the date of actual completion and acceptance by DGH. Liquidated Damages shall be applicable individually for delays in:

- (a) Completion of Mobilization (T): Calendar Day 14 from LoA.
- (b) M1 — Phase 1 Retrospective Assurance Report (T1): Calendar Day 60 from LoA.
- (c) M2 — Metadata Standardisation and Entitlements Advisory Report (T2): Calendar Day 120 from LoA.
- (d) M3 — O&M Handover Readiness Assessment and Final Advisory Summary (T3): Calendar Day 180 from LoA.

Notwithstanding the individual applicability of these penalties, the total aggregate amount of liquidated damages on account of delay across all milestones shall not exceed a maximum of 10% of the Total Contract Value. For the purpose of this clause, “Completion” is defined as the submission of final, evidence-based reports and deliverables that meet the technical satisfaction of DGH; any rejection of deliverables due to technical inadequacy shall not stop the accrual of LD until a revised and acceptable version is submitted.

9 Deployment Model and Infrastructure Responsibility

The engagement is advisory and audit-based in nature. No hardware infrastructure, software deployment, or cloud provisioning is required from the Contractor.

9.1 Mobilization and Project Kick-off

Mobilization shall commence at the DGH / NDR Office. Within seven (7) days of the issuance of the Letter of Award (LoA), the Contractor shall convene a formal Project Kick-off Meeting at the DGH / NDR Office. The meeting shall be attended in person by the Project Manager, who shall from this point be stationed at the NDR Office for the entire duration of the contract. The proposed core technical leads (the Data & Metadata, Cloud, Security, and

Data Governance specialists) shall attend the Kick-off Meeting, in person or online, and shall be formally introduced to DGH.

At the Kick-off Meeting, the Contractor shall present its mobilization plan, confirm the deployment of Key Personnel, and finalise jointly with DGH the Engagement and Communication Plan and the Milestone-Deliverable Mapping Register. The mobilization period shall conclude within fourteen (14) days of the LoA, in accordance with Section 8.

9.2 Physical Presence of Specialists and Visa Provision

Specialist personnel may work off-site during execution, but their physical presence at the DGH / NDR Office is mandatory for milestone validation, milestone review meetings, and milestone closure, in accordance with Clause 10.3. Where any specialist is required to travel from outside India, the Contractor shall be responsible for obtaining the necessary business visas and travel authorisations in a timely manner. DGH shall, on request, provide reasonable supporting documentation (such as invitation or engagement letters) to facilitate visa processing. The Contractor shall plan its mobilization and milestone scheduling to accommodate applicable visa-processing timelines, and no extension of milestone dates or Liquidated Damages relief shall be claimed on account of delays in obtaining visas, save for delays directly attributable to DGH's failure to provide requested supporting documentation within a reasonable time.

9.3 General Infrastructure and Access

For the purpose of conducting audit activities, DGH shall provide the Contractor with read-only access to the NDR 2.0 cloud environment as deemed necessary and at the sole discretion of DGH. Such access shall be strictly limited to audit and review purposes only. The Contractor shall not download, copy, transfer, share, or circulate any data, documents, or artefacts accessed through the cloud environment. All audit findings, observations, reports, and recommendations shall be shared exclusively with DGH and shall not be disclosed, reproduced, or disseminated in any form whatsoever including print, digital format, presentation, publication, conference proceedings, or any other medium without the prior written consent of DGH. Any breach of this condition shall be treated as a material breach of contract and shall entitle DGH to terminate the engagement with immediate effect, without prejudice to any other legal remedies available to DGH.

The Contractor shall bring and operate its own workstations / laptops, necessary computing equipment, and software applications for the duration of the engagement. DGH shall not be responsible for providing any computing equipment or software applications to the Contractor.

The Contractor shall provide senior specialist services in the form of structured independent audit and review activities, deliverable outputs, and advisory recommendations.

The Contractor shall specify any minimum access requirements, including access to documentation, system reports, and agreed data samples required to perform its audit activities, and DGH shall endeavour to facilitate such access to the extent operationally feasible.

To ensure seamless governance and real-time oversight, the Contractor's Project Manager shall be dedicated to this engagement and shall be stationed at the NDR Office for the entire duration of the contract. The Project Manager shall act as the primary point of contact for DGH and shall coordinate the activities of the specialised technical teams assigned to each milestone.

For each milestone defined in the Scope of Work, the Contractor shall deploy specific technical experts (Data, Cloud, Security, etc.) as identified in its technical proposal. While these teams may work off-site during the execution phase, their presence is mandatory for milestone validation and closure.

10 Manpower, Key Personnel and Deployment

10.1 General

The Contractor shall deploy a multidisciplinary team of senior specialists sufficient to discharge the entire Scope of Work and to produce every Deliverable listed at Section 4.

10.2 Minimum Key Personnel

The Contractor shall deploy, at a minimum, the following Key Personnel:

S. No	Key Personnel	Minimum Qualification	Minimum Experience	Deployment
1	Project Manager	Graduate degree in Engineering, Computer Science or Information Technology, or Master's in Geology / Geophysics, or MBA; with PMP / PgMP / PRINCE2 certification	12 years total, including 5 years leading data-migration, cloud-transformation or IT audit / assurance engagements	Full-time, stationed at the NDR Office for the entire 180 days
2	Senior Data & Metadata Specialist	Graduate degree in Geoscience, Petroleum Engineering, Computer Science or equivalent	10 years in E&P / G&G data management, including experience on a National Data Repository or comparable national E&P data platform	Milestone-based; on-site presence mandatory for milestone validation and closure
3	Cloud Architecture & Cost Specialist	Graduate degree in Engineering / Computer Science; cloud Architect certification (AWS / Azure / GCP) preferred	8–10 years in cloud architecture, including cloud cost governance, storage optimisation or FinOps	Milestone-based; on-site presence mandatory for milestone validation and closure
4	Data Governance & Entitlements Specialist	Graduate degree in a relevant discipline	8 years in data governance, including role-based access control, data entitlements frameworks and access auditability	Milestone-based; on-site presence mandatory for milestone validation and closure
5	Security & Compliance Specialist	Graduate degree in Engineering / Computer Science; CISA, CISSP, CEH or equivalent preferred	8 years in information-security audit or assurance, with familiarity with CERT-In and STQC requirements and VAPT artefact review	Milestone-based; on-site presence mandatory for milestone validation and closure

A single individual may fulfil more than one specialist role (S. No 2 to 5), provided that they meet the qualification and experience criteria for each role relied upon; the Project Manager shall not double as a specialist. The Contractor shall deploy at least three (3) distinct specialists in addition to the Project Manager. Certifications indicated as “preferred” are desirable and not mandatory for eligibility.

10.3 Deployment Obligations

- The Project Manager shall be dedicated exclusively to this engagement and shall be stationed at the NDR Office for the entire duration of the contract. The Project Manager shall not be deployed on any other assignment during the contract period.

- Specialist personnel may work off-site during execution, but their physical presence at the DGH / NDR Office is mandatory for milestone validation, milestone review meetings, and milestone closure.
- The technical personnel responsible for each Deliverable, together with the Project Manager, shall attend the Milestone Review Meeting in person, as required under the Special Terms and Conditions.
- Knowledge transfer sessions shall be delivered by the specialist responsible for the relevant subject matter, and not by the Project Manager alone.

10.4 Substitution of Key Personnel

- Key Personnel named in the accepted technical proposal shall not be substituted without the prior written approval of DGH.
- Any proposed replacement shall possess qualifications and experience equal to or better than the person being replaced, and shall meet the minimum criteria at Clause 10.2. DGH reserves the right to reject any proposed replacement.
- Substitution of the Project Manager shall additionally require a handover period of not less than ten (10) working days, with both the incumbent and the replacement present at the NDR Office.
- Where Key Personnel are substituted without prior approval, or where deployment falls short of Clause 10.3, DGH may withhold acceptance of the affected Deliverable until the deficiency is remedied.