|  |
| --- |
|  |
| ONR Technical Assessment Guide  Safeguards |



ONR Technical Assessment Guide (TAG)

Safeguards

Authored by: Safeguards Inspector

Approved by: Professional Lead – Safeguards

Professional Lead: Professional Lead – Safeguards

Issue No.: 4

Publication Date: Jan-2023

Next Major Review Date: Jan-2026

Doc. Ref.: SG-TAST-GD-001

Record Ref. No.: 2020/321658

Table : Revision commentary

|  |  |
| --- | --- |
| Issue No. | Description of Update(s) |
| 3 | - Incorporates comments from operator community following sharing of draft versions in March 2020 (Issue 1) and September 2020 (Issue 2).  - Incorporates comments from ONR Safeguards inspector use of the draft version in trial assessment activities throughout the UK SSAC Project. |
| 4 | - Incorporates learning and provides clarifications based on ONR Safeguards inspector use of Issue 3 since ONR became the domestic UK safeguards regulator on 31 December 2020. |

Contents

[1. Introduction 4](#_Toc126056646)

[2. Purpose and Scope 4](#_Toc126056647)

[3. Relationship to Licence and other Relevant Legislation 5](#_Toc126056648)

[4. Relationship to Safety Assessment Principles, WENRA Reference Levels, and IAEA Safety Standards and Guides 7](#_Toc126056649)

[5. Advice to Inspectors 8](#_Toc126056650)

[References 10](#_Toc126056651)

[Glossary and Abbreviations 11](#_Toc126056652)

[Appendix 1: Basic Technical Characteristics (BTC) Assessment 12](#_Toc126056653)

[Appendix 2: Assessment of Nuclear Material Accountancy and Control Plans (ACPs) 19](#_Toc126056655)

# Introduction

1. ONR has established its [Safety Assessment Principles](http://www.onr.org.uk/saps/saps2014.pdf) (SAPs) [1] which apply to the assessment by ONR specialist inspectors of safety cases for nuclear facilities that may be operated by potential licensees, existing licensees, or other duty-holders. The principles presented in the SAPs are supported by a suite of guides to further assist ONR’s inspectors in their technical assessment work in support of making regulatory judgements and decisions. This technical assessment guide (TAG) is one of these guides.
2. Guidance in the form of technical assessment guides (TAGs) is derived from ONR’s role as the regulator to guide regulatory judgements and recommendations when undertaking safeguards assessments of operator submissions; namely nuclear material accountancy and control plans (ACPs) and basic technical characteristics (BTC) submissions.
3. Underpinning the requirement for these submissions, and ONR’s role in their regulation, are the legal duties placed on organisations subject to the Nuclear Safeguards (EU Exit) Regulations 2019 [2] (hereafter referred to as ‘NSR19’).

# Purpose and Scope

1. This TAG contains guidance to advise and inform ONR safeguards inspectors in the exercise of their regulatory judgement during general assessment activities. Additional detail in relation to specific submissions can be found in the appendices of this document.
2. Assessment of submissions is a fundamental component of ONR’s work. It is appropriate therefore to consider how this should be undertaken to:

* ensure assessment work is appropriately comprehensive and proportionate.
* maximise the effectiveness of available effort; and
* promote consistency in the standard of assessment.

1. TAGs are not a prescriptive set of legal requirements or operator guidance and should not be referred to as such. However, as they are based on openly available national and international advice, they may be used as a source of guidance or good practice when advising operators.

# Relationship to Licence and other Relevant Legislation

1. Operators are required under NSR19 to make several submissions to the ONR. These are listed in Table 2.

Table : Submissions required under NSR19

|  |  |
| --- | --- |
| Regulation | Submission |
| 3 | Declaration of Basic Technical Characteristics of a qualifying nuclear facility, using the relevant questionnaire in Part 1 of Schedule 1 |
| 4 | Annual Outline Programme of Activities using the information described in Part 8 of Schedule 1 |
| 7, 8 | Accountancy and Control Plan |
| 12 | Accounting Reports |
| 13 | Initial Book inventory using format in Part 4 of Schedule 1 |
| 14 | Inventory Change report format set out in Part 2 of Schedule 1. |
| 15 | MBR and PIL using Part 3 of Schedule 1 |
| 16 | Special report if Reg 17 or Reg 23 events occur |
| 21 | Notification of Export |
| 22 | Notification of Import |
| 24 | Change of dates related to Reg 21 and 22 |
| 30 | Transfers of conditioned waste using form set out in Part 9 or part 10 of Schedule 1 |
| 31 | Application to become Qualifying nuclear facility with limited operation |
| 32 | Exemption from NSR19 |
| 33 | Withdrawal of materials from civil activities |

1. This guidance specifically covers Regulations 3, 4, 7 and 8 (those highlighted) as the submissions from these have substantial written components that require an inspector’s judgement to determine if (a) they are compliant with NSR19 and (b) that, where applicable, they are adequate for submission to the IAEA in line with the timelines associated with the UK/IAEA voluntary offer safeguards agreement (VOA) [3].
2. Assessment against Regulations 7 and 8 for qualifying nuclear facilities with limited operation (QNFLO) are anticipated to be of a proportionately lower complexity and reduced size than for larger operators of qualifying nuclear facilities (QNFs) who typically hold greater quantities of qualifying nuclear material (QNM). Inspection and assessment of QNFLOs is captured in the ONR management system (QNFLO inspection and assessment of ACP’s and BTC’s).
3. Regulation 16 may fall under this guidance if the specific cause of a special report relates to a relevant submission subject to assessment.
4. This guidance does not cover Regulations 31 and 32. The submissions from Regulation 31 also have written components that require an inspector’s judgement and decision to determine that (a) they are compliant with NSR19 and (b) that the operator is in sufficient compliance for the request to be agreed to. The assessment and decision making are more straightforward and captured in the ONR management system (QNFLO Regulation 31 Reduced Reporting).
5. Regulations 12-15, 21 and 22 are covered by ONR safeguards nuclear material accountancy activities which, being data focussed, have an independent approach from the written submissions covered in this guidance document.
6. The submissions covered by this guidance contain both prescriptive and outcome focussed components and whilst NSR19 does not call directly for assessment, ONR may choose to determine via assessment if they meet the expectations related to that submission in terms of correctness, completeness, and adequacy.

# Relationship to Safety Assessment Principles, WENRA Reference Levels, and IAEA Safety Standards and Guides

1. The ONR Guidance for Nuclear Material Accountancy Control & Safeguards (ONMACS) [4] sets out the ONR expectations pertaining to operators’ nuclear material accountancy, control, and safeguards (NMACS) systems and provides the essential foundation for outcome focussed regulation.
2. This guidance aligns those expectations with the details of the operator submissions and, where necessary, provides the inspector with additional guidance regarding the completeness and adequacy of responses to prescriptive requirements of NSR19.
3. Under the UK/IAEA VOA [3], ONR (on behalf of the UK) is obliged[[1]](#footnote-2) to send to the IAEA all submissions against Regulation 3, 4, 12-16, 21, 22, 24 and 33 for those QNFs covered within the legal framework of the VOA and in line with the timescales set out under that agreement. These submissions allow the IAEA to define their safeguards approach for the UK and individual facility’s.
4. With relevance to this guidance, NSR19 allows the UK to meet its international reporting obligations to the IAEA by requiring submission of a BTC to ONR under Regulation 3. This facilitates the UK submitting complete, correct, and adequate design information to the IAEA in the form of a BTC submission.

# Advice to Inspectors

1. Assessment is the act of making a judgment by the consideration of relevant evidence. The purpose of assessment is to allow ONR to reach an independent and informed judgment on the adequacy of an operator’s submission.   
   Assessment is used to inform ONR whether the operator is, or will be, compliant with relevant legislation.
2. The scope of an assessment can vary considerably, from a full formal technical assessment (detailed and deep dive) to a strategic level light assessment (shallow cross-cutting review). The scope of the assessment, any sampling strategy and the resulting regulatory judgements are determined by the inspector and decisions should be recorded in an assessment report. Templates relating to ACP assessment or BTC assessment are included within the well-informed regulatory decision making (WIReD) system and the inspector will be asked to select the correct template.
3. When performing an assessment, the Safeguards inspector should refer to the ONR guidance on the mechanics of assessment [5]. This guidance details the approach to the assessment, which is simplified here:
   1. **Adequacy of information supplied by the operator** - consider the presentation of this information and the quality of the submission prior to commencing assessment. Factors to consider include is it comprehensive, coherent, accurate, adequately structured, and consistent?
   2. **Sampling** - Judgement is necessary both in deciding whether to assess a particular submission at all and in the degree of sampling that should be allocated if it is assessed. However, whatever submissions and samples are assessed, it is always important to apply sufficient rigour to arrive at defensible, evidence-based judgements. It is seldom possible or necessary to assess a submission in its entirety. In general, the inspector should undertake a broad review of the highest-level claims and arguments and then undertake the majority of sampling in areas of high significance, since weaknesses in these areas represent the greatest risk.
   3. **Undertaking assessment** - When carrying out assessment of operator’s submissions ONR inspectors should avoid passive reading of the submission. To provide independence and active assessment of the submission the inspector should initially consider their expectations, without reading (much of) the documentation to identify relevant good practice and expectations for topics that should be considered and addressed by the submission.
   4. **Queries during the assessment process** - During the assessment queries will arise which will require clarification from the operator. This is expected and the inspector should consider the best method of following up with the operator. How this additional assurance is then recorded is important for traceability and reference within the assessment report.
   5. **Interfaces with other assessments** - The inspector should, where relevant, ensure that interfaces between different specialist assessments do not lead to gaps. This is particularly the case where specialists in other ONR purposes are also using similar information for assessment.
   6. **Areas of regulatory concern** - Where areas of regulatory concern are identified, it may be necessary to raise regulatory issues so that the operator develops and delivers a suitable action plan. Further information on the management of regulatory issues is provided in other ONR guidance [6].
   7. **Actual plant condition compared to documented claims** –   
      The inspector should be aware that there may be a difference between the implied claims in the submission paperwork and the actual plant configuration or condition. As the relationship between the plant and the associated submission is not always as rigid as might be assumed, the justification, sometimes representing a claimed state or expectation, may not be fully attained in practice. Appropriate measures should be taken to verify or test the claims made, and it is recommended that a facility visit, or inspection is performed in support of the assessment. This activity should be targeted against specific rather than general plant features.
   8. **Judging adequacy** - It is the responsibility of the inspector carrying out the assessment to judge when and if a submission is adequate. Although it can be assumed that the operator believes a submission to be adequate, the inspector must have in mind a clear and independent image of what adequacy means, must be able to recognise when it has been achieved and be able to defend that judgement if challenged by the operator.
4. Guidance on the assessment of BTC submissions is covered in Appendix 1.
5. Guidance on the assessment of ACP submissions is covered in Appendix 2.

# References

|  |  |
| --- | --- |
| [1] | ONR, “Safety Assessment Principles (SAPs) for Nuclear Facilities - 2014 Edition (Revision 1),” 2020. |
| [2] | HM Government, “The Nuclear Safeguards (EU Exit) Regulations 2019,” [Online]. |
| [3] | IAEA, “INFCIRC/951 - Agreement between the UK of GB and NI and the IAEA for the Application of Safeguards in the UK of GB and NI in Connection with the Treaty on the Non-Proliferation of Nuclear Weapons,” January 2021. [Online]. |
| [4] | ONR, “ONR Nuclear Material Accountancy Control & Safeguards (ONMACS)”. |
| [5] | ONR, “NS-TAST-GD-096 - Guidance on Mechanics of Assessment”. |
| [6] | ONR, “ONR-RIO-PROC-001 - Management of Regulatory Issues”. |
| [7] | ONR, “SG-INSP-GD-001 - Safeguards”. |
| [8] | IAEA, “IAEA Design Information Questionnaire (DIQ) Completion Guidance – Parts I and II (STR-398),” 2021. |
| [9] | IAEA, “AEA International Safeguards Guidelines for the Post-Operational Phases of Nuclear Facilities and Locations Outside Facilities (STR-396, Revision 1),” 2021. |
| [10] | Department of Trade and Industry, “Definition of Essential Equipment for Facility Operation – An Operator’s Perspective (SRDP-R260),” 2022. |
| [11] | IAEA, “International Target Values for Measurement Uncertainties in Safeguarding Nuclear Materials (STR-368 - Revision 1.1),” 2022. |
| [12] | Cogent, “National Occupational Standards for Nuclear Material Accountancy and Safeguards (COGNMAS 1-14, Version 3),” 2011. |
| [13] | ISO, “ISO/IEC 17025:2017 - General requirements for the competence of testing and calibration laboratories,” 2017. [Online]. |
| [14] | “ISO 10012:2013 - Measurement Management Systems – Requirements for Measurement Processes and Measuring Equipment,” 2013. |
| [15] | OILM, “Recommendations and Publications from the International Organisation of Legal Metrology”. |

# Glossary and Abbreviations

ACP Accountancy and Control Plan

AR Assessment Report

BTC Basic Technical Characteristics

CNSS Civil Nuclear Security & Safeguards (Office for Nuclear Regulation)

DIQ Design Information Questionnaire

FA Facility Attachment

IAEA International Atomic Energy Agency

INFCIRC IAEA Information Circular

LC Licence Conditions

LOF Location Outside Facilities

NCA Nuclear Co-operation Agreements

NMAC Nuclear Material Accountancy & Control

NMACS Nuclear Material, Accountancy, Control and Safeguards

NSR19 The Nuclear Safeguards (EU Exit) Regulations 2019

OIML International Organisation of Legal Metrology

ONMACS ONR Guidance on Nuclear Material Accountancy, Control & Safeguards

ONR Office for Nuclear Regulation

PSP Particular Safeguards Provisions

QNF Qualifying Nuclear Facility

QNFLO Qualifying Nuclear Facilities with Limited Operations

QNM Qualifying Nuclear Material

RAACP Regulatory Assessment of ACPs

SQEP Suitably Qualified and Experienced Person

TAG Technical Assessment Guide

VOA Voluntary Offer Agreement

WIReD Well-Informed Regulatory Decision Making

# Appendix 1: Basic Technical Characteristics (BTC) Assessment

**Purpose and Scope**

1. This appendix provides guidance for safeguards inspectors in the assessment of an operator’s declared basic technical characteristics (BTC) submission for a qualifying nuclear facility (QNF). The purpose of the assessment is to establish the completeness, correctness, and adequacy of that submission to comply with NSR19 and meet, where necessary, international obligations. A BTC should provide the inspector with enough information to design a proportionate and targeted regulatory intervention approach for the QNF.
2. This guidance facilitates a consistent approach to the assessment of BTCs submitted under NSR19 against the ONR’s expectations based on relevant good practice. Operators must declare a BTC, or a change to a BTC, using the relevant questionnaire required[[2]](#footnote-3). Some of the information required is prescriptive and there are also areas where the operator is free to use their own methodologies to supply the required information. These areas require the inspector to make a judgement whether the information is clear, complete, correct, and adequate to meet the requirements of NSR19 and international obligations.
3. The scope and purpose of activities to be performed by ONR inspectors during assessment of BTCs should be clearly outlined in the scope of any BTC assessment and the expectations against which the inspector should assess the declaration should also be referenced.

**Relationship to Relevant Legislation**

2. NSR19 requires the operator to produce a BTC document for each QNF, the purpose of which is defined in the relevant questionnaire in Part 1 of schedule 1 of NSR19. Relevant regulations include regs 3 (1-5), 5(1), 5(4).
3. BTCs are used to describe safeguards-relevant design information on nuclear installations.
4. There are eight facility types with different questionnaires:

* Reactors
* Critical and zero energy installations
* Qualifying nuclear facility’s where conversion, fabrication and reprocessing are carried out
* QNF that are used for storage
* QNF where isotopes are separated
* QNF using qualifying material in quantities in excess of one effective kilogram
* QNF for the treatment and storage of waste
* Other QNF or a QNF with limited operation

1. If it is not obvious which questionnaire is the best fit for a facility, the operator should discuss this with the inspector and agree on the correct questionnaire.
2. Each type of facility has a BTC questionnaire requiring information at proportionate levels of detail to:

* Identify the date of issue/revision.
* Identify the facility - including the operator and location of the facility and types of QNM the operator manages there and generally the description of the installation, the form, quantity, location and flow of QNM being used, the layout of the installation and any containment features.
* Describe the accountancy and control approach - in terms of the procedures for Nuclear Material Accountancy, Control & Safeguards (NMAC&S) including procedures for physical inventory taking and organisational arrangements for accountancy and control of qualifying nuclear material. The inspector should consider whether this information is captured elsewhere e.g., in the facility ACP and if so, is there sufficient cross-referencing.

1. ONR uses the information to ensure that operators comply adequately with NSR19 and, where included on the eligible facilities list (within the UK/IAEA VOA [3]) the IAEA uses this information to determine its safeguards approach in the UK. This may include the IAEA selecting the facility for implementation of safeguards and if so, the BTC information allows the IAEA to develop and prepare the safeguards approach for the installation.
2. Under Regulation 3(3) an operator must inform ONR of the changes to a BTC and although there is no requirement to resubmit that BTC it is an ONR expectation that the operator will submit a revised BTC with that change highlighted within the timescales set out in NSR19.
3. Regulation 3(5) allows the ONR to request in writing any further details, explanations, amplifications or clarifications of any information required for regulatory purposes which the operator must then supply.
4. For new QNFs under Regulation 3(4) the operator must declare BTCs at several design and construction stages:

* Preliminary design information - as soon as the decision to construct or authorise construction has been taken.
* Final design information – not later than 200 days prior to the commencement of construction.
* As built design information - not later than 200 days prior to receipt of the first qualifying nuclear material.

1. Submissions of these declarations and those supplied throughout the lifecycle of the QNF should be considered for assessment on the same basis for the BTCs of operating facilities.
2. Additional advice related to assessment and inspection of the BTCs supplied throughout the lifecycle of the QNF may be found in the related appendix of the Nuclear Safeguards Technical Inspection Guide (TIG) [7].

**Advice to Inspectors**

1. Inspectors should assess compliance by comparing the BTC declaration against the prescriptive requirements in NSR19 and then assess the adequacy of the declaration for the non-prescriptive aspects against the expectations included in ONMACS and in relevant IAEA guidance documents relating to the submission of design information ([8] and [9]). Inspectors should also ensure that operator declarations are in line with the expectations defined within relevant ONR licence conditions (LC) where applicable.
2. Where the inspector considers the assessed BTC declaration adequately complies with NSR19, including meeting the expectations and the legal timescales on which ONR must submit BTCs on behalf of the UK to the IAEA, the inspector should, where appropriate, arrange submission to the IAEA via the agreed route.
3. All activities related to the assessment of a BTC should be captured by the inspector in an assessment report (AR) using the relevant template within the WIReD system as guided by reference. That document should include their justification as to why the submitted BTC meets the requirements.
4. Where non-compliance is identified from the assessment the AR should state the inspector’s judgment on the degree of non-compliance and proposed regulatory action which may include advice to the operator on how to achieve compliance.
5. The assessment of a BTC involves activities carried out by ONR to determine that the operator has provided all relevant descriptive and technical information required by NSR19 and that this information is kept up to date and supplied to the ONR at the intervals required by NSR19. Inspectors should also advise operators that is good practice to perform a periodic review of BTCs, and to have associated management arrangements in place to perform those reviews, to ensure they are complete and correct.
6. Inspectors may wish to use the document review dates and intelligence from other NMACS information available to ONR concerning the relevant QNF to judge whether this information is up to date.
7. Inspectors should consider other relevant documents available to ONR to inform the assessment such as a Facility Attachment (FA) (should the facility be selected by the IAEA for implementation of safeguards), ACP’s or any Particular Safeguards Provisions (PSPs) made under Regulation 5 when the BTC is initially being produced or if amendments are made to the BTC. The inspector should also consider if there are any requirements included within nuclear co-operation agreements (NCAs) in relation to those aspects of the operator accountancy and control system required by NSR19 Regulation 6 that may need to be included within the BTC.
8. BTC assessment is an evaluation of the content and adequacy of design and operating information contained in the BTC. Assessment of the information included in a BTC should support the development of preparations for on-site activities (where confirmation of the information within the BTC would take place), as well as the wider safeguards regulatory approach.
9. The inspector should establish any pre-existing ONR regulatory approaches at a QNF and should utilise an integrated approach that aligns the needs of all ONR purposes.
10. Inspectors may, as part of the BTC assessment, consider whether an ONR Particular Safeguards Provision (PSP) may be necessary for the QNF as described in Regulation 5.
11. ONR inspectors should utilise their assessment of the BTC to inform the production of a list of ‘Essential Equipment’ for the QNF (important items of equipment, systems, and structures necessary for the declared operation of a QNF [10]).   
    This can be used to help inform ONR’s approach to regulating compliance with NSR19, which will include confirming that a QNF has been decommissioned for safeguards purposes.

**BTC Assessment**

1. The breadth and depth of BTC assessment shall be established by the inspector and proportionate to the degree of prescriptive review required to meet NSR19.   
   The following factors may be considered in determining the scope of a BTC assessment and whether the BTC for a QNF covered within the legal framework of the UK/IAEA VOA meets the expected requirements and must be sent onto the IAEA within the defined timescales:

* the level of confidence ONR has in the operator’s NMAC system which includes the arrangements to produce and keep BTCs up to date.
* the quality and completeness of the information presented.
* the type of QNF and its operational status.
* the category, quantity, and use of Qualifying Nuclear Material (QNM).
* the degree of change since the previous review; and
* recent events, incidents, or operating experience, safeguards-specific and otherwise at the QNF, or similar facilities.

1. BTC submissions should consist of a correct and completed questionnaire which contains information that is proportionate and appropriate for the QNF.
2. Prior to the commencement of the assessment the Safeguards inspector should set out, around the relevant questionnaire for the QNF, proportionate expectations for the information required to support:

* assurance that the operator understands and manages the NMACS challenge.
* the ONR or, where appropriate, the IAEA to plan a compliance / safeguards inspection or visit.

**Regulatory Expectations - Prescriptive Requirements**

1. The inspector should determine the following during assessment:
   1. The correct questionnaire from Schedule 1 of NSR19 has been utilised, as described in Regulation 3(1).
   2. The information is complete with regards to the questionnaire in Schedule 1 of NSR19.
   3. All specific legal information has been correctly and adequately provided e.g., owner, operator, location.
   4. Any BTC submissions or changes to BTC that have been made are in line with the timeliness requirements of Regulation 3 of NSR19, as well as those included in any other relevant domestic or international agreement e.g., FA, PSPs, NCAs etc.
   5. That, in compliance with Regulation 8, amendments of a BTC that relate to the ACP are captured in an associated amendment of the ACP and vice-versa.
   6. Whether any further details, explanations, amplifications, or clarifications of any information are required based on what is declared in the Schedule 1 questionnaire.
   7. Whether all the requirements within a PSP and / or FA have been complied with (as identified in this appendix).
   8. Is in line with the expectations outlined in any relevant site licence conditions.

**Regulatory Expectations - Non-Prescriptive / Free text**

1. The BTC should:
   1. Be structured logically using the relevant questionnaire in Schedule 1 of NSR19.
   2. Meet the needs of those who will use it (e.g., operators, maintenance staff, technical staff, managers accountable for safeguards, ONR and the Agency).
   3. Use terms and descriptions that are understandable to the key users, where possible utilising standard safeguards terminology and otherwise clarify/explain novel terminology.
   4. Be clearly owned by both those who are accountable for compliance with NSR19 and those who rely on the BTC for accurate and objective information on accountancy and control measures to make informed decisions.
   5. Define the envelope of the QNF BTC including, where reasonable and necessary:
      1. the expected QNM flow routes and their locations within the QNF including where QNM can be held and declared.
      2. the accountancy points at which transfer of QNM custody occurs including those that will be the basis for recording the location and transfers of QNM.
      3. methods for determining the quantity of QNM transferred including where possible relevant evidence for the definition of these methods.
   6. Provide sufficient proportionate information on the QNF to demonstrate that the operator understands and manages the NMACS challenge and enable the ONR to determine its approach to regulating compliance with NSR19 including planning for inspections. This includes:
      1. geographical location
      2. numbers of buildings
      3. design intent and current purpose or use[[3]](#footnote-4)
      4. current lifecycle stage and status of operation
      5. managerial structure including responsibilities
         1. quantities and state of QNM, i.e., amounts, physical state, container types and numbers
         2. inventory locations
         3. other containment requirements
         4. reference to supporting information and its location.
   7. Present the Operator accountancy arrangements to be used for both operator and ONR reporting purposes which should proportionately and where appropriate include:
      1. QNM flow and inventory measurement points.
      2. Attainment of the accurate and precise accountancy and control of QNM as set down in the IAEA International Target Values for Measurement Uncertainties in Safeguarding Nuclear Materials [11].
      3. Operator safeguards equipment & measures used to ensure the completeness of flow and inventory measurements appropriate for the QNF.
2. The BTC does not have to hold all this information in one document. However, it should have adequate referencing to ensure all areas of the relevant questionnaire are complete and to signpost to information that demonstrates the BTC is a live, correct, and adequate document. Additional guidance in this respect is included in ONMACS (e.g., FSE9).

**Periodic Review of BTC**

1. BTCs should be periodically assessed throughout the lifetime of a QNF (according to the lifecycle phases defined in ONMACS) to ensure the inspector maintains assurance.
2. The inspector should stay abreast of any relevant regulatory intelligence such as changes in a QNF lifecycle phase, safeguards significant modifications to the QNF or other dutyholder or strategic factors which will help inform targeting of assessment activities.

# Appendix 2: Assessment of Nuclear Material Accountancy and Control Plans (ACPs)

**Purpose and Scope**

1. NSR19 [2] requires operators of QNFs to maintain a system of accountancy and control of the relevant QNM. Regulation 6 of NSR19 covers the system of accountancy and control and operators are required to implement the relevant components of a system of accountancy and control in a manner which is proportionate to and appropriate for the QNF.
2. NSR19 requires operators to produce an accountancy and control plan (ACP), which sets out their system of accountancy and control. This ACP shall describe in writing the arrangements and procedures adopted or to be adopted by the operator to establish and maintain that system. The purpose of an ACP is to signpost, underpin and explain how NMACS is being implemented in a manner that is proportionate and appropriate for the QNF. A functional ACP helps relevant stakeholders understand the arrangements and procedures that deliver nuclear material accountancy, control, and safeguards (NMACS) at a QNF and ONR expectations are set out in ONMACS.
3. ONR Safeguards inspectors may assess ACPs to reach an independent and informed regulatory judgement on whether the ACP adequately describes an NMACS system in compliance with the requirements of NSR19 and ONR’s expectations in this regard. This appendix provides guidance for safeguards inspectors on ONR’s regulatory expectations for an adequate ACP and provides a framework for inspectors to draw proportionate, targeted, and consistent regulatory judgements regarding the adequacy of an ACP.
4. This appendix also provides a transparent explanation of ONR’s regulatory expectations for an ACP that may inform engagement between operators and ONR during the production of an ACP, prior to any assessment of that ACP and during its ongoing maintenance.
5. This appendix does not provide prescriptive requirements for the content and structure of an ACP but describes the function of an ACP, and outcomes an ACP should deliver to achieve that function. It is expected that operators will understand their NMACS arrangements and procedures sufficiently well to describe them in whichever way best delivers a functional ACP in a proportionate and targeted manner.
6. This appendix does not provide guidance for safeguards inspectors in the assessment of the NMACS arrangements and procedures (“NMACS assessment”) described in an ACP. The ONMACS set out the ONR expectations pertaining to operators’ NMACS systems and is the foundation for drawing judgements regarding the adequacy of NMACS arrangements and procedures described in an ACP.

**Relationship to Relevant Legislation**

1. Regulation 6 of the NSR19 requires an operator to maintain a system of accountancy and control of the relevant QNM in each QNF. The operator is also required to implement the components of that system in a manner which is proportionate to and appropriate for the QNF. This document does not provide guidance on making judgements against these regulatory requirements. Guidance on this topic is provided for in ONMACS.
2. Regulation 7 requires an operator to “produce an accountancy and control plan which sets out the accounting and control system for the qualifying nuclear material in that facility”. It also requires that an ACP “describe in writing the arrangements and procedures adopted or to be adopted by an operator to establish and maintain the system of accountancy and control of qualifying nuclear material as required by regulation 6” (above). Regulation 9 requires that “an operator must implement and comply with the arrangements and procedures described in the accountancy and control plan.” This document provides guidance on making judgements against these regulatory requirements.
3. Regulations 7, 8, and 9 make further requirements regarding the timely submission of ACPs, the replacement and amendment of ACPs, and the timely submission of any replacement or amended ACPs. Operators of QNFs shall submit ACPs to ONR as soon as possible, and not later than 200 days prior to the first receipt of QNM at the QNF.
4. Regulation 7 allows ONR to approve an ACP or parts thereof. Where ONR has approved an ACP or parts thereof, Regulation 8 requires operators to receive prior written consent before amending any parts of an approved ACP. ACPs or parts thereof shall only be approved where an assessment of the arrangements and procedures in question indicate that approval is a necessary and proportionate step to assuring adequate NMACS is maintained. Such circumstances are expected to be rare, and approval shall be recommended by the Safeguards inspector in their assessment report and require agreement by the Safeguards Professional Lead.

**Relationship to ONMACs and Other Guidance**

1. The purpose of an ACP is to signpost, underpin and explain how NMACS is being implemented in a manner that is proportionate and appropriate for the QNF. While ONR’s expectations pertaining to NMACS are set out in the ONMACS, an ACP does not have to mirror or match the structure of ONMACS to fulfil its purpose.
2. The assessment of an ACP shall be targeted, and any judgements made through assessment shall be proportionate to the QNF in question, in alignment with the ONR Safeguards sub-division inspection and assessment strategy. ONR shall take a sampling approach to ACP assessment and may or may not assess all submitted ACPs or parts thereof. The targeting of any assessment sample should be guided by relevant regulatory intelligence and further informed by the ONMACS.
3. The assessment of an ACP may inform the targeting of other regulatory activities carried out by ONR (such as inspection efforts, BTC assessment or follow up through routine level 3/4 engagements) and be included in planning future safeguards interventions. For example, where assessment of a submitted ACP identifies arrangements and procedures that are inadequately sign-posted or described, further assessment or inspection effort may be targeted to determine that those arrangements and procedures in use by the operator are meeting NMACS expectations adequately.
4. The inspector should also ensure that arrangements presented in an operator’s ACP are in line with expectations of relevant LCs if applicable.

**Advice to Inspectors**

1. NSR19 does not place prescriptive requirements on operators regarding the structure, format, and content of an ACP. Inspectors shall judge the adequacy of an ACP against the following **Unifying Purpose Statement**:

“The purpose of an ACP is to signpost, underpin and explain how NMACS is being implemented in a manner that is proportionate and appropriate for the QNF. A functional ACP should ensure relevant stakeholders capture and understand the arrangements and procedures that deliver Nuclear Material Accountancy, Control and Safeguards (NMACS) at a QNF.”

1. An ACP may be a single document or a collation of documents, providing it fulfils this Unifying Purpose Statement. This statement can be expanded into six interrelated expectations on the regulatory assessment of ACPs (RAACPs) that collectively represent ONR’s view on an adequate ACP. These expectations are:

* RAACP 1: Scope
* RAACP 2: Functionality
* RAACP 3: Content
* RAACP 4: Ownership
* RAACP 5: Expertise
* RAACP 6: Maintenance

1. These expectations should be applied in a proportionate and targeted manner. It is seldom proportionate or necessary to assess an ACP in its entirety, and sampling should be used to sufficiently probe the areas that need to be scrutinised and manage the total effort to be applied. Those areas of an ACP not assessed through sampling may be inspected during routine inspection activity or through other assessment activities (including such as BTC or NMACS arrangements). Assessing a well-targeted sample to suitable depth may reveal any broader or generic weaknesses in the ACP as a whole and the inspector should then use this intelligence to inform future intervention activities.
2. ACP assessment should be targeted to those aspects of the RAACP expectations that reflect defined regulatory requirements and are most significant in the delivery of the Unifying Purpose Statement. Where ACP assessment reveals shortfalls against the RAACP expectations, the ONR Safeguards inspector response should be proportionate to the impact the shortfall has on the delivery of the Unifying Purpose Statement.
3. To record and manage identified shortfalls, the ONR Safeguards inspector should look to influence operators primarily within the timescales of the assessment and record the finding and resolution in the assessment report. For shortfalls that do not prevent the delivery of the Unifying Purpose Statement and cannot be closed out prior to the completion of the assessment, the inspector should record any recommendations for follow-up assessment or inspection in the assessment report. For shortfalls which prevent the delivery of the Unifying Purpose Statement and cannot be closed out prior to the completion of the assessment, the inspector should use the management of regulatory issues guidance [6]. The regulatory issue should be managed appropriately by the inspector raising it and within the sub-division governance expectations.
4. The inspector should approach ACP assessment with a clear understanding of the QNF and its use of QNM. This understanding should not be used to create prescriptive expectations for the form or structure of the ACP but should inform a proportionate interpretation of the expectations below.
5. The inspector may not find all the information required to assess an ACP or part thereof in the ACP submission itself. Where an inspector cannot draw judgements regarding the adequacy of an ACP against an RAACP expectation, the inspector should identify that gap to the operator and provide the operator with the opportunity to address it. The inspector should draw on all objective, impartial, and relevant information submitted by the operator for assessment, including any information referenced by those submissions. Where an operator fails to address any gaps in information, an inspector should draw an impartial judgement on the adequacy of the ACP through objective information identified by or incorporated into the ACP submission, rather than by assumption or prior knowledge.   
   Generic ONR guidance for the mechanics of assessments is available [5].

*RAACP 1: Scope*

1. The operator shall maintain a system of accountancy and control of all relevant QNM in each QNF. The scope of an ACP shall therefore describe arrangements and procedures for NMACS of all relevant QNM, including retained waste, conditioned waste, and ores. The ACP may be a single document or a collation of documents if its scope incorporates all relevant QNM in all relevant QNFs.
2. An operator’s system of accountancy and control shall include the additional obligations set out in Regulation 19 of NSR19. The scope of an ACP shall therefore reflect arrangements and procedures for accounting for obligations placed on QNM by nuclear cooperation agreements (NCAs), including arrangements and procedures for tracking NCA obligations when multiple obligations are assigned to the same batch or process.
3. The scope of an ACP shall reflect all relevant components of an accountancy and control system as required by Regulation 6 of NSR19. The structure of the ACP does not have to align with ONR’s expectations for an accountancy and control system (set out in ONMACS). However, an operator and an inspector should be able to use the ACP to understand how all relevant components are being implemented, and why any components that are not implemented are not relevant to the QNF.
4. The scope of an ACP should recognise and reflect all arrangements and procedures that are necessary to implement the accountancy and control system required by Regulation 6 of NSR19 in a proportionate and appropriate manner, including those that are not primarily or predominantly implemented to deliver NMACS. For example, an operator may recognise and reflect any relevant license condition compliance arrangements or security arrangements that contribute to or underpin NMACS.
5. An operator shall amend an ACP in response to a relevant change in the BTC of the QNF. The scope of an ACP should therefore recognise and reflect the QNF life-cycle stages, including any recent or impending transitions from one stage to another. The ACP for any lifecycle stage should build on the ACP for previous stages.

*RAACP 2: Functionality*

1. The ACP should present a coherent and well-structured explanation of how NMACS is carried out, that is accessible and understandable to both the operator and to ONR.
2. The ACP should consider the needs of those that will use the ACP to deliver appropriate and proportionate NMACS at a QNF. This includes operational technicians, nuclear material custodians, nuclear material accountants, technical personnel, managers, and all other staff who hold responsibilities for maintaining NMACS.
3. The ACP should be integrated into an operator’s existing arrangements and document management systems such that the ACP and any written arrangements described therein can be accessed appropriately. The ACP should be recognised by broader operator strategies and policies as a functional document that supports the delivery of NMACS. The terminology and structure of the ACP should be recognisable and understandable to those that will use it.
4. The ACP should present clear and robust arguments regarding the implementation of NMACS, supported with references to information that is relevant, objective, and accessible. All arguments and supporting information should be presented in a logical structure, using terminology that is understandable and which facilitates independent, informed, and impartial judgements regarding the implementation of NMACS (including through NMACS assessment).

*RAACP 3: Content*

1. The ACP should identify all information that is necessary and sufficient to support its explanation of NMACS and facilitate independent, informed, and impartial judgements regarding the implementation of NMACS. The breadth and depth of supporting information should be proportionate to the quantity and use of QNM in question.
2. The ACP should present supporting information to a proportionate level of detail that clearly and efficiently signposts inspectors towards accessible evidence to inform their judgement. For example, where one aspect of a broader package of information demonstrates the implementation of NMACS, that aspect should be identified and accessible to ONR. The ACP should support and guide the resolution of questions or queries regarding the implementation of NMACS that may arise during inspection or assessment.
3. The ACP should not identify supporting information to a disproportionate level of detail that obscures the information that is sufficient to support the explanation of NMACS and that makes the production, use and on-going maintenance of the ACP unmanageable.
4. The ACP should recognise appropriate benchmarks, standards, and relevant good practice for NMACS including, for example, the International Target Values for Measurement Uncertainties in Safeguarding Nuclear Materials [11]; the National Occupational Standards for Nuclear Material Accountancy and Safeguards [12]; International Organization for Standardization (ISO) standards ([12] and [13]); and International Organization of Legal Metrology (OIML) Recommendations [15].
5. The ACP should recognise uncertainties and limitations in nuclear material accountancy and control that are inherent in the QNM or QNF in question. The ACP should present supporting information that demonstrates that appropriate caution and mitigations have been put in place to manage these uncertainties and limitations.

*RAACP 4: Ownership*

1. The ACP should be owned by those accountable for complying with NSR19 and ONRs expectations for NMACS. The ownership of the ACP should contribute to fulfilling its purpose by providing suitable visibility, awareness, and understanding of NMACS to those that are responsible for compliance with the NSR19 and those that make decisions impacting NMACS.
2. The ownership of the ACP should also contribute to fulfilling its purpose by integrating the ACP into relevant management arrangements at an appropriate level, providing access to suitable expertise and facilitating its maintenance.
3. The ownership of the ACP, and the responsibilities that come with ownership, should be recognised by the operator, and clearly demonstrated through the ACP submission and the management arrangements it is integrated into.   
   Any amendment to the ownership of the ACP should be recognised within the operator’s organisation and its processes.

*RAACP 5: Expertise*

1. The operator should draw on suitably qualified and experienced personnel (SQEP) to develop and maintain an ACP that reflects the range of QNM at the QNF and its various uses. The ACP should draw on the expertise of those that will use the ACP, including those that implement NMACS daily and those that may draw on the ACP for more strategic or managerial purposes.
2. The ACP should recognise expertise outside the operator, including industry groups, professional organisations, and relevant good practice.
3. The ACP should be subject to appropriate quality management systems, including by any internal independent assurance functions that may exist, reflecting its ownership.

*RAACP 6: Maintenance*

1. An operator shall amend their ACP in response to a relevant change in the BTCs of the QNF in question. Relevant changes may include those relating to:

* The capacity. throughput, category, form, and use of QNM.
* The lifecycle stage or status of the QNF.
* The flow of QNM through a QNF.
* The description of the accountancy and control system (including methods for operator’s physical inventory taking); and
* The description of measurement, measurement quality control, and analytical methods for accounting the flow of QNM through a QNF.

1. Other factors that should inform the review of an ACP include:

* Changes to the quantity, category, and use of QNM.
* Changes arising from accountancy, control, safeguards, safety or security events, operating experience, and examination or testing results.
* Changes to relevant good practice, relevant international standards (including international target values), or other new information arising from external sources;
* The outcome of periodic reviews of NMACS arrangements and procedures.
* Changes due to the QNF or its associated systems, structures and components ageing or degrading.

1. The operator shall implement and comply with the arrangements and procedures described in the ACP and shall amend the ACP where necessary to properly reflect the arrangements and procedures being implemented. Where ONR has approved an ACP or parts thereof, and operator shall maintain those arrangements and procedures and shall seek written consent from the ONR to alter those arrangements and procedures.
2. The ACP is a dynamic document (or set of documents) and should be reviewed periodically on a defined basis to maintain its validity, quality, and correctness. These reviews should be overseen by the appropriate owner, informed by the appropriate expertise and any operational experience gained since the previous review.

1. The duty on ONR to do this is also specified in Reg 42 of NSR19 [2]. [↑](#footnote-ref-2)
2. NSR19 Schedule 1, Part 1 ‘Questionnaire for the declaration of the Basic Technical Characteristics of a Qualifying Nuclear Facility’ [2]. [↑](#footnote-ref-3)
3. In common with other areas of regulation surrounding the management of radioactive materials the term ‘use’ includes storage as storage is both an activity and particularly for radioactive materials requires actions to deliver it [↑](#footnote-ref-4)