NETHERLANDS OIL AND GAS EXPLORATION AND PRODUCTION ASSOCIATION

INDUSTRY STANDARD NO. 42

Well Examination

18 December 2019

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Index

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Document Control Sheet

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1	1-7-2017	Adjustment to revision Mining Act as per 1-1-2017	AK	G.J. Windhorst	
2	18-12-2019	Reviewed in 3-yearly update cycle: no changes needed			

This document will be controlled in accordance with the NOGEPA Industry Standard No. 80 on Standards and Document Control.

Abbreviations

AIM	Asset Integrity Management
EXCOM	Executive Committee of NOGEPA
IV	Independent Verification
MBW	Mijnbouwwet
MBB	Mijnbouwbesluit
MBR	Mijnbouwregeling
MEA	Ministry of Economic Affairs
MH	Major Hazard
NOGEPA	Netherlands Oil and Gas Exploration and Production Association
OPCOM	Operations Committee of NOGEPA
OSD	Offshore Safety Directive
PEC	Project Execution Checklist
RIGG	Rapport Inzake Grote Gevaren
RoMH	Report on Major Hazards
SECE	Safety & Environmental Critical Element
SodM	State Supervision of Mines

Terms and definitions

Term	Meaning
Independent Verification	Independent Verification means an assessment and confirmation of the validity of particular Written Statements by an entity or an organisational part of the operator or the owner that is not under the control of or influenced by, the entity or the organisational part using those statements.
Major Accident	means in relation to an installation or connected infrastructure: (a) an incident involving an explosion, fire, loss of well control, or release of oil, gas or dangerous substances involving, or with a significant potential to cause, fatalities or serious personal injury; (b) an incident leading to serious damage to the installation or connected infrastructure involving, or with a significant potential to cause, fatalities or serious personal injury; (c) any other incident leading to fatalities or serious injury to five or more persons who are on the offshore installation where the source of danger occurs or who are engaged in an offshore oil and gas operation in connection with the installation or connected infrastructure; or (d) any major environmental incident resulting from incidents referred to in points (a), (b) and (c). For the purposes of determining whether an incident constitutes a major accident under points (a), (b) or (d), an installation that is normally unattended shall be treated as if it were attended.
Material Changes Wells	In the case of a notification of Well Operations, a change to the basis on which the original notification was submitted including, inter alia, physical modifications, replacement of one installation with another, availability of new knowledge or technology and operational management changes.
Offshore Safety Directive	Directive 2013/30/EU of the European Parliament and of the Council of 12 June 2013 on safety of offshore oil and gas operations.

Term	Meaning
Project Execution Checklist	A list prepared by the Well Examiner of the program steps and values which the Well Examiner considers critical to the safe execution of the Well Operation and to the implementation of the examined well design.
Report of Findings	The report with the Well Examiner's conclusions and findings from the Well Examination, issued by the Well Examiner to the Well Operator, and which is to be submitted as part of a well notification to SodM.
Responsible Committee	The committee of NOGEPA that has been appointed by the EXCOM as the owner of a specific Standard.
Suitability Statement	A statement of the Well Operator, that, after considering of the Report of Findings, the risk management relating to the well design and its barriers to loss of control are Suitable for all anticipated conditions and circumstances, and which is to be submitted as part of a well notification to SodM.
Suitable	Right or fully appropriate, including consideration of proportionate effort and cost, for a given requirement or situation, based on objective evidence and demonstrated by an analysis, comparison with appropriate standards or other solutions used in comparable situations by other authorities or industry.
Well Examination	Well Examination is an independent assurance process on behalf of the Well Operator to give independent assurance that the pressure boundary of the well is controlled throughout its life and the pressure-containment equipment that forms part of the well is suitable for the anticipated well conditions at all times.
Well Examiner	The Well Examiner is an Independent Verifier performing the Well Examination.
Well Operation	Any operation concerning a well that could result in the accidental release of materials that has the potential to lead to a major accident, including the drilling of a well, the repair or modification of a well, the suspension of well operations and the permanent abandonment of a well.
Well Operator	The Well Operator is the Operator carrying the responsibility for the well, being the licencee who is appointed as operator by MEA (of the sole licencee).
Written Statement	A Written Statement is a performance report of (a group of) SECE's (SECE-block).

Legal Requirements

Dutch Mining Act MBW *(Mijnbouwwet)*	MBW 45l Independent Verification MBW45n.3 Notification Well Activity
Dutch Mining Decree MBB (Mijnbouwbesluit)	MBB 67, 68, 69, 70, 71, 72, 73 MBB 74, MBR 8.2.1 8.2.3 8.2.4 (work program) MBB 76, MBR 8.2.2 Bijlage 11 Bijlage 12 (day report, end report) MBB 75, 77 MBB 84e, 84f, 84g Independent Verification
Dutch Mining Regulation MBR (Mijnbouwregeling)	MBR 11a.5.1, 11a.5.2, 11a.5.3 Independent Verification
Dutch Civil Code BW (Burgerlijk Wetboek)	BW art. 6:177, art. 3:310 section 2.
Offshore Safety Directive	OSD Annex I, 4; Annex V.

Related Standards

Standard 48	Independent Verification (validation by independent expert)
Standard 49	Independent Verification Execution (validation by independent expert) re. Installations, decommissioning, pipelines
Standard 83	RIGG (Report on Major Hazards for production installations)
Standard 90	Asset Integrity Management

Important Nomenclature used in this Standard

In the context of this Standard and when so used to describe a method or practice:	
'shall'	means that such method or practice reflects a mandatory provision of law (in Dutch: *dwingend recht*). Such method or practice is mandatory for those who are the addressees of such provision (mostly the operators). A Standard can describe or quote, but not amend, mandatory provisions. When an operator in exceptional cases for technical, operational or HSE reasons cannot comply, exceptions shall be documented and reported, and risks mitigated. Please note that this does not release the operator from the obligation to comply with the law. *
'should'	means that such method or practice reflects a Good Operating Practice. An operator is generally expected to apply such method or practice, but a specific situation may require a specific alternative. In other words: the operator complies or explains, and documents the explanation. *
'could'	means that such method or practice is of an advisory nature or mentioned by way of example. An operator is not obliged to comply and is not obliged to explain if he does not comply.
* Please refer to paragraph 2.3 of Standard 80 (Standards and Document Control), for further explanation on an exception of a 'shall' provision, or on a comply-or-explain of a 'should' provision.	

1. Executive Summary

The Mining Act defines Well Examination as a process of independent assurance that the well design and well control measures are suitable for the anticipated well conditions at all times.

The Well Operator **shall** have his own scheme of independent verification of Well Operations complete with an organigram displaying how Well Operations, including Well Engineering and Independ Well Verification is organized. The scheme **shall** include 'dispute resolution 'and/or Well Examiner's access to Senior Management of the Well Operator.

The Managing Director of the Well Operator is accountable for the management and adherence to the scheme of independent verification.

Well Examination focusses on the integrity of a well. Key elements of Well Examination are:

- before the start of the Well Operations (i) a Well Examiner **shall** review relevant well documentation and (ii) issue a report of findings to the Well Operator, which report (iv) is to be considered by the Well Operator and (v) is to be submitted to SodM.
- (vi) The Well Examiner **shall** be involved in review and assessment of Material Changes (= significant changes, see definition).
- The Well Examiner **shall** also monitor progress of the Well Operations against certain critical elements of the well program ("PEC list").

Well Examination is the Scheme of Independent Verification of Well Operations which, pursuant to the MBW, each Well Operator must establish and submit to SodM. Chapter 8 provides details on the Scheme of Independent Verification for Well Operations.

Wells that are connected to a Production Installation are often identified in the risk assessment for the installation as Safety and Environmentally Critical Elements, as described in the report on major hazards for the installation. As such Independent Verification is required that the Wells are Suitable and that the schedule of examination and testing of the safety and environmental critical elements is suitable, up-to-date and operating as intended.

At revision 1 the content has been adjusted to the revision of the Mining Act as per 1-1-2017, due to the implementation of the EU 2013/30/EU Offshore Safety Directive.

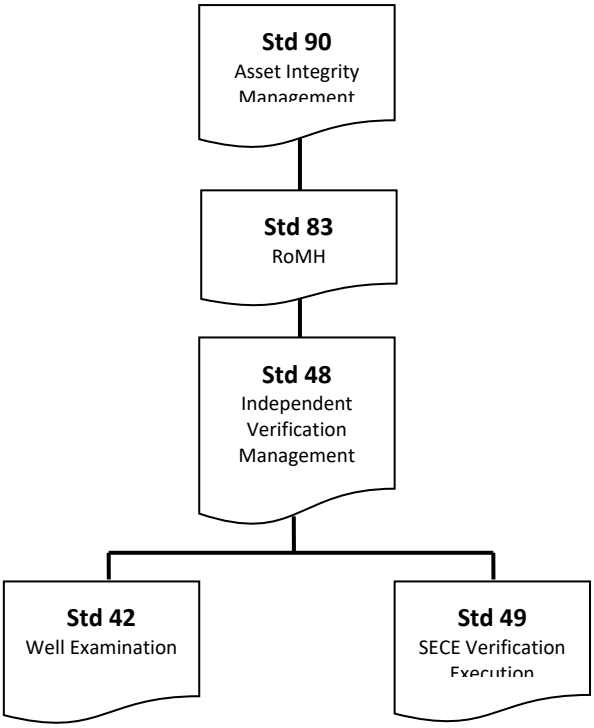
2. Scope and Application

2.1 Scope

This Standard lists the requirements and guidance for Independent Verification of Design, Construction if operated as intended, Well Intervention and Decommissioning in the Oil & Gas-industry for on- and offshore exploration and production facilities.

Nogepa Asset Integrity Standards

Standard 42 is part of Nogepa Asset Integrity standards as outlined below.



Standard 90 describes practical approaches to Asset Integrity Management (AIM). It provides general guidance on good practice and is geared to enable and maintain management systems that fully address these conditions.

Standard 83 is a goal setting document describing the regulatory requirements for a RoMH and provides a template to draw up a compliant RoMH document. The RoMH provides a SECE listing for Independent verification.

Standard 48 contains principles and requirements for independency, impartiality of Independent Verification and provides the principles for Standard 42 and 49.

Standard 42 works out the requirements and provides guidance for Well Examination during Design, Construction, Intervention and Abandonment.

Standard 49 contains principles and requirements for independency, impartiality of Independent Verification of SECE's.

Examinable Well Operations:

All activities that change the architecture of wells are considered examinable, e.g.:

- Drilling including re-entry/ side track.
- Workovers, i.e. pulling of the completion and or associated tubing hanger and tree.
- (re-)Perforations in a different formation or pressure zone.
- Suspension of well operations.
- Permanent abandonment.
- Hydraulic fracturing.
- Velocity string installation.

More routine activities, where the architecture of a well is not changed, are not considered individually examinable, e.g.

- Wireline.
- Production logging.
- Caliper surveys.
- Acidization.

The applicable set-up of the pressure and well control equipment on the well during routine activities should be examined by a Well Examiner once every 5 years as a general set-up or on a case by case bases.

2.2 Application

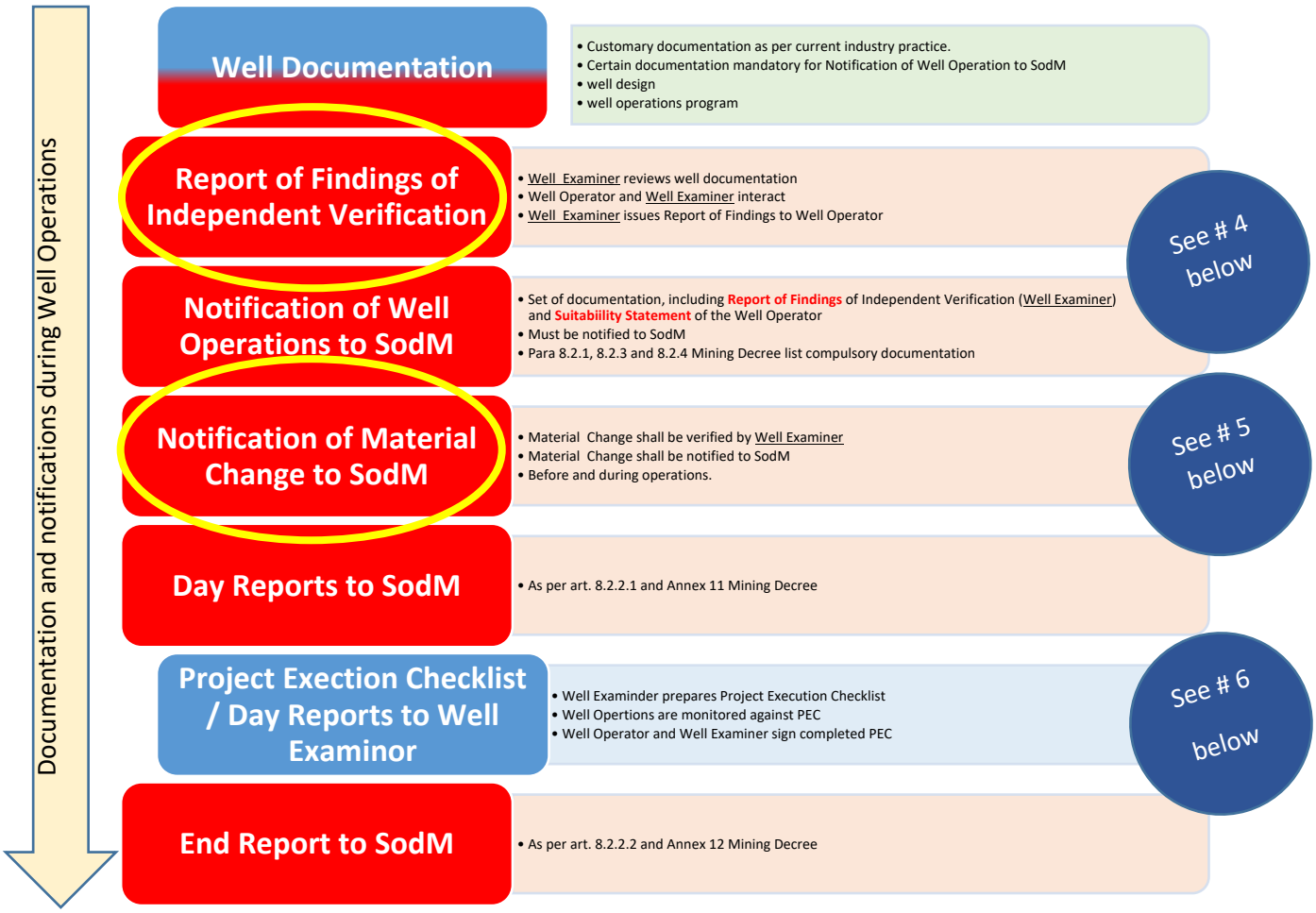
Involvement of Well Examiner / SECE Verifier (see also Standard 48 & 49)

Nogepa Standard	42	42	49	42	49	42
Phase	**Design**	**Construction**	**Operational Phase**	**Well Intervention**	**Operational Phase**	**Abandonment**
	Well lifecycle					
Examiner or Verifier	Well Examiner	Well Examiner	SECE-block Verifier	Well Examiner	SECE-block Verifier	Well Examiner

The table represents the role of Independent Verification during the life cycle of the well.

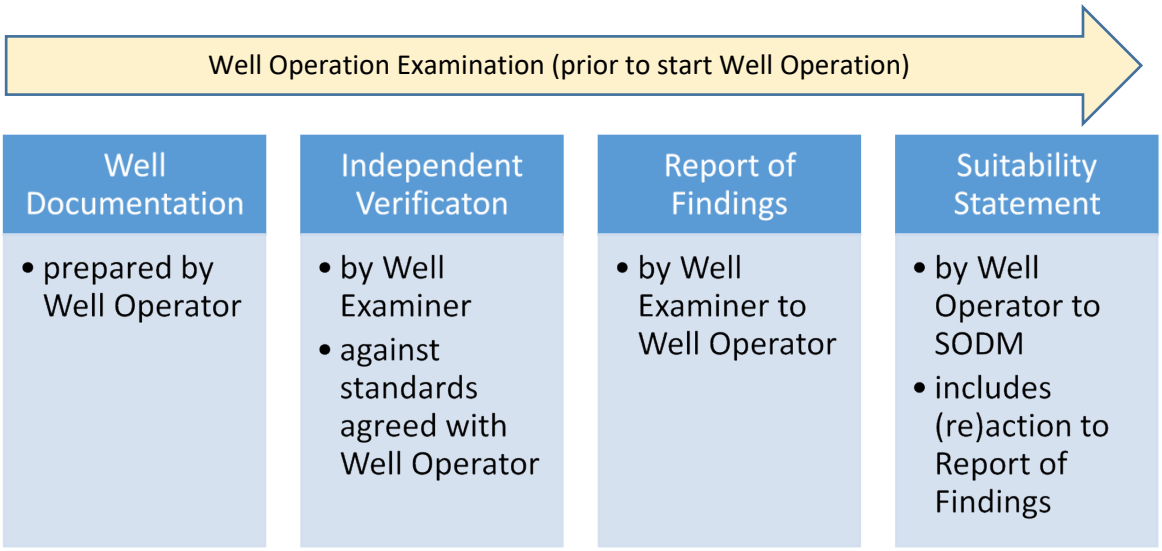
Legend to graph “Documentation and notification during Well Operations”

Red cells means mandatory (legal) obligations
Blue cells means customary practice



4. Well Examination, Report of Findings, Suitability Statement

The Well Examination of Well Operations generally consists of the steps shown in the graphic below. These steps are further explained in the subparagraphs of this chapter.



4.1 Well Documentation for the Well Examiner

The Well Operator **shall** provide to the Well Examiner written or electronic files or documents (either separately or integrated) regarding:

- Work program
- Casing design
- Completion design
- Kick Tolerance
- Tubing stress analysis
- Well control measures
- Geological data
- Offset wells details
- Risk assessments
- Pore pressure and fracture gradient
  Typically the Well Operator will follow the list of article 8.2.1.1 of the Mining Decree.
- Applicable company standards (see 4.2 below)

4.2 Verification and Assessment by the Well Examiner

The Well Operator and the Well Examiner **should** agree legislation and standards to be applied in the verification. These include the Dutch Mining legislation, NOGEPA Industry Standards and often company standards provided and common industry standards.

The Well Examiner **should** assess, based upon these standards and his or her own knowledge and expertise, whether in the view of the Well Examiner, the well design and well control measures are Suitable for the anticipated well conditions at all times.

The Well Examiner and the Well Operator **should** interact with each other as appropriate during the verification and assessment. In particular the Well Examiner **should** contact the Well Operator if he or she has any concerns as to the intended Well Operations and/or the well documentation.

4.3 Report of Findings of the Well Examiner

Following the verification and assessment the Well Examiner **shall** issue to the Well Operator a Report of Findings. The Report of Findings contains the Well Examiner's views and findings with respect to the Suitability of the well design and well control measures for the anticipated well conditions at all times.

4.4 Report of Findings and Suitability Statement to be sent to SodM

The Well Operator **shall** consider and take appropriate action with respect to any issues raised in the Report of Findings. This shall be properly documented.

A Notification of Well Operations to SodM **shall** include (among others requirements) the Report of Findings and a statement of the Well Operator, that, after considering the report and findings of independent Well Examination by the independent verifier, the risk management relating to well design and its barriers to loss of control are Suitable for all anticipated conditions and circumstances (the "Suitability Statement"). The Suitability Statement **shall** refer to or include the actions and considerations of the Well Operator in response to the Report of Findings.

If the Well Examiner does not have significant findings, the Suitability Statement can be a short formal statement.

5. Material Change (= 'significant change') to be discussed with Well Examiner

The Well Operator **shall** request the Well Examiner to examine any Material Change to a Notification of Well Operations and **shall** immediately inform SodM of such Material Change to such submitted notification. The Well Operator **shall** document the involvement of the Well Examiner.

The MBW states that SodDM **shall** consider those notified changes and, if deemed necessary, take appropriate action.

6. Project Execution Checklist

The following process **shall** be followed:

- The Well Examiner **shall** prepare a Project Execution Checklist, listing the program steps and values which the Well Examiner considers critical to the safe execution of the Well Operation and to the implementation of the examined well design. The Well Examiner sends the PEC to the Well Operator.
- The Well Operator **shall** send daily reports to the Well Examiner with sufficient detail to enable tracking of Well Operations against the PEC, and including any unplanned events.
- Material Changes **shall** be examined as set out above at #5, and may result in amendment of the PEC.
- At the end of the Well Operation, both the Well Examiner and the Well Operator **shall** sign the PEC completed with actual values.

7. Document Management and Retention

The Operator **shall** maintain a Well file including (without limitation) a completion drawing, equipment specifications, test certificates, Suitability Statement, completed PEC, tallies and Well handover sheet including the report of Independent Verification (Well Examination) and the documentation regarding remedial actions, for a period until at least 6 month (legally required) after completion of the related Oil & Gas operations.

Regarding Well liability after abandonment, the Well Operator **should** maintain the Well file until the legal liability period of 30 years after permanent abandonment of the well or for a longer period regarding legal liability for a well leak not caused by soil or tectonic movements.

8. Scheme of Independent Verification

The MBW requires that the Well Operator shall establish schemes for Independent Verification and prepare a description of such schemes. The scheme of independent verification should be included within the safety and environmental management system.

To the extent a Well is a Safety and Environmentally Critical Element of a Production Installation, there is a strong connection and overlap between Well Examination (MBW article 45l / MBB 84e) and independent verification to give independent assurance that the Safety and Environmental Critical elements identified in the risk assessment for the installation, as described in the Report on major Hazards, are Suitable and that the schedule of examination and testing of the safety and environmental critical elements is suitable, up-to-date and operating as intended (MBW article 45l / MBB 84f). To the extent of the overlap, the same examination and documentation could be used.

9. Competency of the Well Examiner

The Well Operator should draw-up a Competence Management System (CMS) to help demonstrate competence for the scope of work. Well Operators shall assure the competency of the Well Examiner as part of his CMS, recognizing that the well examiner is “sufficiently knowledgeable” for the task.

A competency profile to cover the types of wells and well operations shall then be drawn up in a job description or contract. Competence assessments shall be carried out is part of the well examination process. The competence of the well examiner shall be reviewed regarding:

- Knowledge (e.g. Dutch Mining regulations, company standards, API Standards, NOGEPA recommended practices and guidelines, well design, casing design etc.)
- Experience (e.g. track record in well operations, examination)
- Skills / aptitude (e.g. auditing, listening, presentation)

The competence shall cover the full life cycle of the well from design to abandonment. Different well-examiners may be used for different stages. Some well types (e.g. HPHT) or operations (e.g. Underbalance and or managed pressure drilling) may need specialist knowledge and skills. Training for the well-examiner may be needed to ensure competence. Technical competence does not need to reside with a single individual: additional well-examiners can be used to provide the full range of competencies required.

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