FOREWORD

DNV GL class programmes contain procedural and technical requirements including acceptance criteria for obtaining and retaining certificates for objects and organisations related to classification.

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Any comments may be sent by e-mail to rules@dnvgl.com

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SECTION 1 GENERAL

1 Introduction
The DNV GL approval of manufacturer (AoM) scheme is a procedure by which the Society approves manufacturers for supply of products in accordance with the Society's rules and standards.

2 Objective
The objective of AoM is to verify the manufacturers’ ability to consistently manufacture materials and products to the given specification and according to the DNV GL rule requirements.

3 Scope
This programme covers the procedures for initial approval, renewal of approval and extension or change of approval, and is based on the requirements given by the Society's rules and standards. It gives the general requirements related to the approval process including the manufacturers application, test plan proposal, works survey, manufacture and testing of sample products, and the general documentation requirements.

4 Application
This programme gives the general provisions for obtaining a certificate as "approved manufacturer" by the Society. It is applicable for metallic material manufacturers delivering products in accordance with the Society's rules and standards.

5 Abbreviations

Table 1 Abbreviations

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Full text</th>
</tr>
</thead>
<tbody>
<tr>
<td>AoM</td>
<td>Approval of Manufacturer</td>
</tr>
<tr>
<td>AR</td>
<td>As rolled</td>
</tr>
<tr>
<td>BCA</td>
<td>Steel grade with qualified brittle crack arrest properties</td>
</tr>
<tr>
<td>BOC</td>
<td>Basic oxygen convertor</td>
</tr>
<tr>
<td>CC</td>
<td>Continuous casting</td>
</tr>
<tr>
<td>CTS</td>
<td>Controlled thermal severity</td>
</tr>
<tr>
<td>CP</td>
<td>Class programme</td>
</tr>
<tr>
<td>COD</td>
<td>Steel grade with qualified CTOD properties</td>
</tr>
<tr>
<td>CTOD</td>
<td>Crack tip opening displacement</td>
</tr>
<tr>
<td>EAF</td>
<td>Electric arc furnace</td>
</tr>
<tr>
<td>GCHAZ</td>
<td>Grain coarsened heat affected zone</td>
</tr>
<tr>
<td>HAZ</td>
<td>Heat affected zone</td>
</tr>
<tr>
<td>Abbreviation</td>
<td>Full text</td>
</tr>
<tr>
<td>-------------</td>
<td>-------------------------------</td>
</tr>
<tr>
<td>IC</td>
<td>Ingot casting</td>
</tr>
<tr>
<td>LF</td>
<td>Ladle furnace</td>
</tr>
<tr>
<td>N</td>
<td>Normalizing</td>
</tr>
<tr>
<td>NDT</td>
<td>Non-destructive testing</td>
</tr>
<tr>
<td>NDTT</td>
<td>Nil ductility transition temperature</td>
</tr>
<tr>
<td>NR</td>
<td>Normalizing rolling</td>
</tr>
<tr>
<td>TM</td>
<td>Thermo-mechanical rolling</td>
</tr>
<tr>
<td>VAD</td>
<td>Vacuum arc degassing</td>
</tr>
<tr>
<td>VD</td>
<td>Vacuum degassing</td>
</tr>
<tr>
<td>VOD</td>
<td>Vacuum oxygen decarburizing</td>
</tr>
<tr>
<td>WPQR</td>
<td>Welding procedure qualification record</td>
</tr>
<tr>
<td>WPS</td>
<td>Welding procedure specification</td>
</tr>
<tr>
<td>WWA</td>
<td>Welding workshop approval</td>
</tr>
<tr>
<td>QT</td>
<td>Quenching and tempering</td>
</tr>
</tbody>
</table>
SECTION 2 APPROVAL PROCEDURE

1 General

1.1 Introduction

In order to be certified, the manufacturer shall demonstrate the ability to consistently manufacture products according to the Society’s requirements and, if relevant, to a given specification. To this effect the manufacturer shall submit documentation showing that the necessary manufacturing, testing and inspection facilities are available and are supervised by qualified personnel. Works surveys by the Society’s representative are required, e.g. to confirm compliance with the submitted documentation. The manufacturer shall also carry out a test program witnessed by the Society’s representative, and the obtained test results shall be submitted for assessment by the Society.

The following are the main steps of the initial approval process (see App.A):

— request for approval. (Manufacturer)
— communicate approval requirements, handle quotation/contract. (Manufacturer/DNV GL)
— prepare and submit initial documentation and test plan. (Manufacturer)
— review of relevant documentation, e.g. product description, manufacturing route, inspection and testing procedures and quality system. (DNV GL)
— review and acceptance of ‘test plan’ prepared and provided by the manufacturer in accordance with the applicable individual approval programme. (DNV GL)
— manufacturing of test products, survey and reporting by the Society’s surveyor. (Manufacturer/DNV GL)
— approval testing in accordance with the accepted ‘test plan’, witnessed by the Society’s representative. (Manufacturer/DNV GL)
— prepare and submit final approval report including all required documentation and test results reports. (Manufacturer)
— review and assessment of approval report. (DNV GL)
— provided the manufacturer is found to have adequate qualifications, approval report is complete and test results are found to meet the applicable requirements, an AoM certificate will be granted. AoM certificates are published on DNV GL’s “approval-finder”. (DNV GL).

1.2 Request for approval

The manufacturer requesting approval (including renewal or extension of existing approvals) shall send a formal application to the Society’s local office. The Society provides a quotation for the requested service.

1.3 Sub-contracting

Sub-contracting part of the production shall be described in the "approval documentation", see Sec.3. Sub-contracting of relevant production steps shall be entrusted only to those sub-contractors named in the approval documentation, unless the sub-contractor is holding a relevant AoM certificate. (Further limitations may be given on the AoM certificate) The Society may require surveys of relevant sub-contractors in the course of the approval procedure. The manufacturer requesting approval by the Society shall ensure adequate quality of the sub-contracted production steps.

1.4 Limitations

Approval is limited to the facilities/production line and premises/plant used for manufacturing of the test products. The manufacturer shall clearly indicate which manufacturing and production facilities that shall be included in the approval, and shall produce the test products accordingly.
The Society’s scope of surveys, assessments and approval testing is limited to the process and products covered by the application for approval.

Significant changes to the manufacturing facilities or processes shall be reported to the Society. The Society may request new surveys and approval testing as found necessary. Relocation of approved manufacturing facilities either in full or part will normally require new initial approval.

Where required by the rules Pt.2, the manufacturer shall prepare a product specification for the manufacturing process, material composition, etc. The approval is limited to the process and composition etc., as given by this product specification.

2 Initial approval

2.1 Approval process
A flowchart illustrating a typical approval process for initial approval is given in App.A.

2.2 Request for approval
The request for approval shall be sent to the local DNV GL office together with the following information:
— name and site address of the manufacturer
— a table with a list of products for which approval is requested including the range of approval
— a description of manufacturing, testing and inspection facilities and equipment.

2.3 Documentation requirements for initial approval
The manufacturer shall prepare the approval documentation as required in Sec.3 and by the relevant individual approval programme.

2.4 Test plan proposal
The manufacturer shall prepare a detailed test plan in accordance with Sec.4 [2] and by the relevant individual approval programme.

2.5 Works survey for initial approval
The manufacturer shall organize a works survey together with the Society’s surveyor. Focus will normally be given to quality control of critical production steps, and that manufacturing, testing and inspection facilities are available and supervised/operated by qualified personnel.

The surveyor will decide the scope of the survey, and may request additional documentation when preparing for the works survey.

Manufacture of test products and approval testing may require separate visits. In case of adequate preparation and agreement with the Society, these steps of the approval process may be combined in one or two visits.

2.6 Manufacture of test products
The manufacturer shall establish a schedule for the production of test products, see Sec.4. The surveyor shall be invited for witnessing of all critical manufacturing steps.

2.7 Approval testing
Approval testing shall be performed in accordance with Sec.4.
3 Renewal of the approval

3.1 Request for renewal
Application for renewal should be made not later than three months before the expiry date of the certificate. Applications received after the expiry of the certificate may require new initial approval if deemed necessary by the Society.

3.2 Documentation requirements for renewal of AoM certificate
For renewal of the AoM certificate, the manufacturer shall submit an assessment report confirming that original approval conditions are maintained and no significant changes have been made to manufacturing process, equipment and procedures. A brief summary report giving statistical information related to certified products supplied to vessels classed by the Society in the previous validity period shall be included. If no products have been subject to certification by the Society for a period of two years, the Society reserves the right to require additional surveys and approval tests.

3.3 Renewal survey
Manufacturer shall invite the Society's surveyor for renewal survey in order to revisit the critical manufacturing steps and to verify that the approved conditions are maintained. During the survey the manufacturer shall provide evidence that the applicable versions of relevant rules, standards and approval programs are applied, and that all requirements given therein are implemented.

3.4 Approval testing for renewal
If there are no significant changes to the manufacturing process, equipment and procedures, new approval testing will usually not be required for renewal of the AoM certificate. However, significant changes to the approved conditions may render new approval testing necessary, although a reduced scope of testing would typically be accepted, depending on the significance of the change.

4 Extension or change of approved range

4.1 Request for extension
An existing AoM certificate may be extended or changed with respect to the "range of approval". Extension of the range of approval may be applied for at any time.

4.2 Documentation requirements for extension
For extensions of, or for significant changes to the approved products or process, the approval documentation specified in Sec.3 shall be re-submitted highlighting the changes to the already approved manufacturing process. A new manufacturing summary and a new testing and inspection plan shall be submitted, including information about new equipment, extended capacity of the existing equipment or change of the product scope.

4.3 Test plan and test products
For test plan proposal, see Sec.4 [2].
4.4 Survey for extension of the approval

A works survey for extension of the approval may be deemed necessary, e.g. if range of products for extension are produced using a manufacturing process, equipment or procedures that were not part of initial approval. Manufacturer shall invite the Society's surveyor for extension survey.

4.5 Approval testing for extension

For extensions of an existing approval to include new products, material or application areas, full approval testing (same as for initial approval) according to Sec.4 will normally be required unless otherwise agreed with the Society.

5 Survey report

For initial, renewal or extension of the approval, the surveyor will prepare a survey report including applicable checklists. The manufacturer shall give the surveyor the necessary access and information in order to complete the report and checklists.

6 Final approval report by manufacturer

On completion of the approval testing, the manufacturer shall prepare and submit a detailed approval report. The approval report shall preferably be organized with the same indexing as given in this program as well as in the relevant individual approval programme. The report shall contain all the information requested in [2.2], [2.3] and [2.4], as well as Sec.3 and Sec.4. The report shall include the request for approval, information on manufacturing route and equipment, documentation of all relevant tests and test results, and include original test records endorsed by the surveyor.

The language of the submitted documentation shall be English.

The approval report shall be signed and dated by the manufacturer’s representative, and submitted to the local DNV GL office.

Incomplete report, or test results not complying with the given requirements may be returned to the manufacturer for correction.

7 Evaluation by DNV GL

The evaluation of compliance with the approval requirements is based on the final approval report, the surveys, and the survey report with applicable checklists.

In case of insufficient documentation or test results the manufacturer will be informed for further actions.

8 Issuance of certificate

Provided the manufacturer is found to have adequate qualifications, the approval report is in compliance with the applicable requirements, all tests are completed and the test results comply with the applicable requirements, an approval of manufacturer certificate will be issued. The certificate will include a list of products covered by the approval. The certificate will be forwarded to the manufacturer, and an entry made in the Society's list of approved manufacturers on the internet (the Approval Finder).
9 Validity

The AoM certificate is valid for three (3) years with no intermediate assessment unless otherwise requested by the Society.

Guidance note:

The surveyor shall be given the opportunity to survey and check at any time all plants and equipment used in the manufacture and testing. The manufacturer shall assist the surveyor to enable him to verify that approved processes are adhered to and to witness the selection and testing as required by the rules.

---e-n-d---o-f---g-u-i-d-a-n-c-e---n-o-t-e---

Renewal of the certificate must be done before the expiry date. For renewal the validity time is extended with three years. Certificates which have expired at the time of renewal will be adjusted according to previous validity date.

For extension of a certificate the validity period will not be changed unless the extension is combined with a renewal, i.e. that all corresponding requirements for renewal are fulfilled.

Any significant alteration to the approved condition during the period of validity, e.g. as described in the approval documentation (Sec.3 of this programme and relevant individual approval programme) shall be reported to the Society. The Society will decide if a new survey/re-testing shall be performed.

Any changes to the name of the manufacturer shall be brought to the attention of the Society. In order to change the name on a certificate the manufacturer shall present formal evidence of the new name, and send an application to the Society accordingly.

New requirements introduced in the Society's rules or class programs during the period of validity may require updating of the approval documentation or additional approval testing. Unless otherwise required by the Society, the new requirements shall take effect at the next extension or renewal of the AoM certificate.

10 Suspension or withdrawal of certificates

An approval of manufacturer certificate may be suspended or withdrawn at any time if the Society finds it justified.

Provisions for suspension and withdrawal of a certificate are given by DNV GL rules RU SHIP Pt.1 Ch.1.
SECTION 3 DOCUMENTATION REQUIREMENTS

1 Introduction
This section is specifying the general documentation required for initial approval. For alterations to the equipment, processes, procedures etc. covered by an existing certificate, the corresponding documentation shall be updated and submitted to the Society for evaluation (surveys, renewal and/or extension of the approval may be required). Further documentation requirements are given in the individual approval of manufacturer programs.

2 Approval report
This section includes the general documentation to be provided in the approval report applicable for all relevant AoM’s. Only information relevant for the manufacturing of the products covered by the AoM certificate shall be submitted. See also Sec.2 [1.3] and Sec.2 [6].

3 Statistics of previous production
A report giving statistical information about recent production, e.g. with respect to chemical composition and mechanical properties of similar grades and products shall be submitted. The report shall preferably be based on products subject to third party verified certification.

4 General documentation of manufacturing route and equipment
All procedures and documentation to be submitted as required by this programme and by each of the individual programs shall be traceable and dated documents with track of revisions etc., and should in general be part of the manufacturer’s QA manual.

The following shall be submitted:
— organisation structure and quality assurance system including quality control responsibilities
— manufacturing process description, visualized in flow charts indicating all process steps, and in particular the associated testing and inspection points
— list of the manufacturers written procedures for testing and inspection. The procedures need not to be submitted (except as given below), but shall be available for review at the manufacturer’s works upon request
— list of equipment used for chemical analysis, mechanical testing, metallographic examination, non-destructive testing, dimensional and thickness measurements, pressure testing, etc.
— evidence of calibration for all relevant manufacturing and testing devices
— documentation of the qualifications of personnel engaged in testing and inspection, including level of certification of non-destructive testing personnel. Where the number of relevant personnel exceeds 10, a list of personnel and their qualifications will suffice
— manufacturers formal procedures (e.g. from quality manual) for product and test samples identification and traceability.

5 Manufacturing summary
The manufacturer shall establish and submit a manufacturing summary for all products, material grades and dimensional ranges which shall be covered by the certificate. Several grades and/or size ranges may be combined into one manufacturing summary where this is convenient.

The manufacturing summary shall specify the sequence of all important manufacturing and sampling/testing steps, and the conditions for control, e.g. by reference to instructions or procedures.
Supply of materials and subcontracted activities relevant for the approval shall be indicated, and the names of suppliers/subcontractors and their approval details shall be provided as appropriate. Production steps performed by subcontractors are subject to documentation and testing requirements as given by the approval programs.
Where a manufacturer applies for extension of an existing approval to cover e.g. larger diameters, new supplier of starting material, etc., the manufacturing summary shall be updated accordingly.

6 Manufacturer products specification
Where required by the Society’s rules, standards, approval programs or by the Society’s representative, the manufacturer shall prepare a separate product specification document. The product specification shall specify all relevant limitations to the approved product and manufacturing process, i.e. where these are supplementary to the basic requirements of the rules, e.g.:

— chemical composition with narrower range limitations
— rolling parameters for NR, TM, BCA, COD steels
— testing requirements and acceptance criteria for special steels, e.g. small scale test for BCA steels.

The specification shall be a traceable document, numbered, dated, with revision numbering and signed by the manufacturer. It will be referred on the AoM certificate, and shall be made available to the surveyor on request.

7 Manufacturers’ own certificate form
Where DNV GL certification of products using the manufacturer’s own certificate form is intended (e.g. in the format of EN 10204 type 3.1 or ISO 10474 type 3.1 etc.) a blank copy of the certificate form and a filled in certificate for a representative product/material shall be submitted. Legends and entries may be in national language, but all information which is required in order to enable assessment as per the DNV GL rules shall be in English language (e.g. in addition to the local language where relevant).
SECTION 4 APPROVAL TESTING

1 General requirements
Unless otherwise specified, the testing and the test results shall comply with the appropriate requirements of the rules, e.g. RU SHIP Pt.2.
In case of newly built manufacturing facilities or newly developed types of products, material grades or manufacturing processes, the Society may request additional tests, increased number of test products and other dimensions of the products for testing.
Further requirements are given in the individual approval of manufacturer programs.

2 Manufacture of test products
The manufacturer shall propose a detailed inspection and test plan (a formal document, dated and with version number), based on the relevant individual approval program. The test plan proposal shall be accepted by the Society before manufacturing of the products to be tested.
Surveyor shall be invited to witness all critical manufacturing steps for the production of test material/products, and for marking of the samples from which test specimens will be prepared. He shall also be given access to carry out a visual examination of the products intended for approval purposes for his reporting, e.g. of the surface condition.
Records and data for the manufacture of the test products shall included in of the approval report.

3 Witnessing of approval testing
The surveyor shall be given necessary access for verification of the calibration status of all relevant testing equipment, that is, testing equipment that will be used for testing of products supplied to DNV GL class. This is also applicable for tests carried out at laboratories recognized and/or approved by the Society.
The surveyor shall be invited to witness all approval testing. Chemical composition test and metallographic analysis is exempted from this requirement unless specifically requested by the Society. If the required testing facilities are not available at the manufacturer, the approval tests may be carried out at a testing laboratory recognized and/or approved by the Society. In such case the surveyor shall be invited for witnessing at the relevant laboratory.
The test reports shall be made available to the surveyor for endorsing.

4 Testing requirements
Unless otherwise specified, the testing procedures, test pieces shape, and test pieces location and orientation shall comply with the applicable requirements of the rules and/or the applicable standards. The test results shall fulfil the requirements of the rules, e.g. RU SHIP Pt.2 or the applicable standard/specification, whichever is stricter (unless otherwise agreed). The following general reporting requirements apply for approval of material manufacturers:
— sketches, drawings and photos showing the position of test blocks shall be included in the test report.
— type of test blocks and their dimensions shall be reported and wherever necessary supported with photographic evidence
— photographs of the tested specimens shall be included in the report. The dimensions of the specimens and the fracture surfaces must be recognizable. The plots of registered load-deformation (stress-strain) curves obtained for the tensile tests shall be included. The loading rates shall be reported.
5 Retesting

In case the test results for any of the approval tests fails to meet the requirements, the manufacturer shall do an evaluation of the root cause for the failure and implement corrective and preventive actions. The root cause analysis report also describing corrective and preventive actions shall be submitted to the Society for evaluation.

Retesting of the same product/heat may be carried out as relevant (e.g., see RU SHIP Pt.2 Ch.1 Sec.2 [3.7] for retesting of materials), although possible acceptance of the retest results will always be based on special consideration by the Society.

Note:
The Society will usually require new approval testing on new products, e.g. materials deriving from new heats.
### APPENDIX A: TYPICAL PROCEDURE TO BE FOLLOWED TO OBTAIN INITIAL APPROVAL OF MANUFACTURER

<table>
<thead>
<tr>
<th>Step No.</th>
<th>Activity</th>
<th>Type of document</th>
<th>Manufacturer</th>
<th>Forwarding</th>
<th>DNV GL</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Request for approval</td>
<td>E-mail/letter</td>
<td>X 1)</td>
<td>→</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Approval requirements, quotation</td>
<td>Rules, approval programs</td>
<td></td>
<td>← X 1)</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Prepare and submit initial documentation and test plan</td>
<td>Detailed documentation and test plan</td>
<td>X 1)</td>
<td>→</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Review initial documentation and test plan, agree on test plan, request more information if necessary</td>
<td>Email/letter</td>
<td></td>
<td>← X 1)</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Prepare for works survey and invite the surveyor</td>
<td>Email/letter</td>
<td>X 1)</td>
<td>→</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Works survey, give comments as applicable</td>
<td>Survey report</td>
<td></td>
<td>← X 1)</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Produce test product under surveyors witnessing, stamping of test product</td>
<td>Inspection and test plan</td>
<td>X 1)</td>
<td>X 1)</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Approval testing under surveyors witnessing</td>
<td>Test reports</td>
<td>X 1)</td>
<td>X 1)</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Prepare final approval report including all approval test results</td>
<td>Approval report</td>
<td>X 1)</td>
<td>→</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Review, request more information or testing if necessary</td>
<td>Comments, draft certificate</td>
<td></td>
<td>← X 1)</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Issue and forward approval certificate</td>
<td>Certificate &amp; invoice</td>
<td></td>
<td>← X 1)</td>
<td></td>
</tr>
</tbody>
</table>

1) X = responsible for forwarding
CHANGES – HISTORIC

There are currently no historical changes for this document.
Driven by our purpose of safeguarding life, property and the environment, DNV GL enables organizations to advance the safety and sustainability of their business. We provide classification and technical assurance along with software and independent expert advisory services to the maritime, oil and gas, and energy industries. We also provide certification services to customers across a wide range of industries. Operating in more than 100 countries, our 16 000 professionals are dedicated to helping our customers make the world safer, smarter and greener.