

Annex D Contractor Document Requirement for Steam turbine / alternator set

D.1 Introduction

Contractor is required to furnish the documents specified herein, in fivefold for hardcopies, within the periods and in accordance with the instructions and conditions shown below.

It shall be clearly understood by Contractor that any fabrication started prior to approval of the relevant design documents is entirely at the risk of Contractor. Approval of documents by Client does not relieve Contractor from his exclusive responsibility for their accuracy and / or correctness and does not relieve Contractor from his obligation to fully comply with the contract.

Client shall ask for and receive preliminary versions of some of the documents, for instance civil and process control documents, a few months after contract.

D.1.1 Format

All documents shall be submitted in digital format and in hardcopy when indicated in the tables below. In case of printed matter, originals are required.

Drawings shall be prepared in formats A1 through A4. All other documents shall be prepared in A4. Prints shall be folded to A4 size, with the title block visible at the front. Prints to be handed over as originals shall NOT be folded.

Submittal in digital format may be either by e-mail or by CD-ROM / DVD. Documents shall be submitted in the software application (format) as specified in tables below. Office documents shall be in release 2003 or higher. Document other than for final documentation (as-built) produced in MS Excel, MS Project and MS Word may be converted to PDF format prior to submittal. Drawings shall be produced and submitted in AutoCAD release 2005 or higher.

D.1.2 Language

All as-built documentation shall be in Dutch language unless otherwise agreed in writing. According to Dutch legislation, operation and maintenance manuals have to be in Dutch language. This consequently means that all major engineering documents (P&ID's, drawings of main components, layouts and lists) and all its KKS coding have to be in Dutch language.

At least the following documents shall be delivered in Dutch:

- operating instructions / operation manual;
- maintenance instructions;
- functional descriptions;
- Piping and Instrumentation Diagrams (P&ID's)

D.1.3 Approval procedure

Client normally requires six (6) working days or any period to be agreed upon from date of receipt for reviewing documents. Any remarks or comments shall be discussed and incorporated by the Contractor, after which the

updated document shall again be submitted. All changes shall be marked clearly. For documents which are marked as 'Proceed' by Client, Contractor shall change the status of the document to 'Released for construction' (RFC) and submit to Client.

In case documents submitted for approval have not been commented within the approval period of 6 working days from the date of receipt, the Contractor shall ask for approval in writing within 1 day. If comments are not submitted within the next day, the document is considered to be approved.

D.1.4 Transmittal

All documents shall be submitted under cover of a transmittal indicating purchase order number, document number, revision, title and the purpose of submission. For each document, the appropriate equipment number(s) shall be indicated.

In order to enable Client to review the Contractor documents in a consistent suitable way:

- Contractor shall not submit updated documents before Client comments on previous issues have been incorporated;
- It is not allowed to change the original document number by the Contractor without written approval of Client;
- Together with manufacturer's data book all documents shall be submitted as shipped documents with tabulation and index.

D.1.5 Document control

It is the responsibility of the Contractor to inform Client about changes made to each document furnished by Contractor. Therefore all re-issued documents shall clearly show identification and/or description of all changes.

A "live" set of documents shall be available at the Contractor's shop at all times for use by Client and/or Third Party inspector.

Contractor shall ensure that, prior to final acceptance of materials and equipment, Contractor's data book is complete and presented to Client and/or Third Party, if so specified, for their acceptance.

Where equipment packages are involved, data books shall be compiled for each of the components separately as applicable. All final documentation to be submitted in rigid binders/covers, including table of contents.

D.1.6 Document numbering

Each document shall have a KKS document number according to Company's specification. Upon request Client shall provide Contractor with document numbers for every document listed in the tables below and additional documents provided by Contractor.

D.1.7 Templates and legends

Each document and drawing will have a standard or typical legend in which the most relevant information is described. Templates for AutoCAD, Word and Excel documents of this legend shall be provided by Client. Contractor shall use this template and make no modifications other than implementing the relevant information. The relevant information shall include as a minimum:

- Document number (as described in section 1.6)
- Document title

- Type of document
- Page number
- Sub-page number
- Filename
- Document size
- Revision number and date
- Author (Contractor)
- Date of document
- Approval (Contractor)
- Date of approval
- Status of Client's approval
- Original Supplier name
- Original document number
- Original requisition number

D.1.8 Penalties

Some of the documents to be submitted by Contractor are needed for other parties in the project. It is of the utmost importance that these documents are submitted as scheduled to prevent delay of the entire project. Therefore Contractor has to pay a penalty for each day delay in accordance with the commercial contract section 2.4.1.

D.1.9 Address

All documents shall be addressed to:
(Advised later)

D.2 General documents

D.2.1 Required general documents

Document description	Special notes	Format	Submitted			Submittal period in weeks	
			with quote	for appr. after contract	final after appr.	after award	after approval
Reference list		W / X	x				
Overall schedule	D.2.2.1	P	x	x	x	4	2
Project execution plan	D.2.2.2	W	x	x	x	* -/- 4	2
List of preferred sub-suppliers		W / X	x				
Certificate(s) of CE-compliance		PDF			x		°
Risk analysis entire scope of supply		W		x	x	30	2
Quality Handbook		W	x				
Inspection & Test Plan		W	x				
Cold + Hot commissioning procedure	D.2.2.3	W / h		x	x	40	**** +2
Performance test procedure		W		x	x	40	* -/- 4
List of spare parts for 2 years of operation		W	x				

- * With delivery to site X MS Excel
- ** With installation manual A AutoCAD
- *** In maintenance manuals P MS Project
- **** At mechanical completion W MS Word
- ° With as-built documentation h To be submitted printed as hardcopy in fivefold as well as digital

D.2.2 Explanation to general documents

D.2.2.1 Overall schedule

The overall schedule shall included among other things the fabrication/inspection schedule and the construction, commissioning schedule.

D.2.2.2 Project execution plan

The plan for execution shall provide detailed information, including, among other things:

- an organigram with the names of the Contractor's personnel planned to work at the Site;
- address list with the telephone numbers of contact persons of the Contractor;
- a description of the Works;
- a risk analysis of all activities performed on the Site;

D.3 Steam turbine/alternator documents

D.3.1 Required steam turbine/alternator documents

Document description	Special notes	Format	Submitted			Submittal period in weeks	
			with quote	for appr. after contract	final after appr.	after award	after approval
Completed datasheets	D.3.2.1	X				3	
KKS codes list	D.3.2.2	X					°
Installation, Operation and Maintenance manual	D.3.2.3	W / h		x	x	40	****
<i>P&ID's</i>							
Steam system		A / h	x	x	x	16	8
Lube oil system		A / h	x	x	x	16	8
Control oil system		A / h	x	x	x	16	8
Instrumentation		A / h	x	x	x	16	8
<i>Process</i>							
List of required utilities	D.3.2.4	X	x	x	x	16	8
Correction curves		PFD		x	x	30	2
<i>Mechanical</i>							
Provisional General arrangement		A	x				
General arrangement drawing		A	x	x		12	14
Equipment list		X			x		°
Forces + moments on turbine connection		W		x	x	16	8
Detailed instruction for installation and removal of insulation supported by drawings		W/A			x		°
<i>Piping & Turbine</i>							
Valve list		X		x	x	34	**
Pipe connection table	D.3.2.5	X		x	x	16	8
<i>Electrical & Alternator</i>							
Preliminary consumer list		W	x				
Consumer list		X		x	x	16	8
Preliminary alternator datasheet		X	x				
Alternator datasheet		X		x	x	16	8
Alternator dimensional and sectional drawings		A		x	x	26	8
Results of calculation of critical		X			x		°

Document description	Special notes	Format	Submitted			Submittal period in weeks	
			with quote	for appr. after contract	final after appr.	after award	after approval
speed alternator and turbine							
Alternator terminal connections		A		x	x	26	8
Alternator characteristic curves		X		x	x	26	8
Turbine control and protection cabinet	D.3.2.6	PDF		x	x	52	*
Interfacing documents (measurements, control signals, etc)		W		x	x	16	8
<i>Instrumentation & Process Control</i>							
Instrument Index		W			x		°
Wiring diagram	D.3.2.7			x	x	52	*
Cable list		X		x	x	30 ¹	6 ¹
Control descriptions		W		x	x	20	6
Configuration control system		W		x	x	9	2
Signal transfer list to overall plant control system (DCS)		X		x	x	16	*
Hard-wire signal list to overall plant control system (DCS)		X		x	x		
<i>Civil</i>							
Turbine foundation calculations		X / h		x	x	32	
Turbine foundation planking and reinforcement drawings		A / h		x	x	32	
Description of all sound attenuating provisions (acoustic enclosure)		W			x		°

* With delivery to site X MS Excel

** With installation manual A AutoCAD

*** In maintenance manuals P MS Project

**** At mechanical completion W MS Word

° With as-built documentation h To be submitted printed as hardcopy in fivefold as well as digital

¹ In accordance with chapter 7 of MAN offer of 5 January 2007

D.3.2 Explanation to steam turbine/alternator documents

D.3.2.1 Completed datasheets

These are the datasheets in Annex A of the technical specification.

D.3.2.2 KKS codes list

The KKS codes used by the Contractor shall be used listed in an excel template provided by Client. The list shall contain the KKS code, a short description of the item, the number of the P&ID and the date. Contractor shall receive the prescription for making KKS codes from Client.

D.3.2.3 Installation, Operation and Maintenance manuals

The installation, operation and maintenance manuals shall contain at least the technical specifications with:

- graphs, sketches, diagrams, drawings;
- descriptions;
- capacity values;
- settings of all process parameters and safety devices;
- energy consumption and use of utilities and resources;
- operation of the steam turbine/alternator package as well as for each component;
- structure main dimensions, connection sizes;
- operation protection, alarms, measurement, control;
- maintenance, dismantling and assembly, repairs, lubrication schedules;
- spare parts and the recommended spare parts lists with brand and type information;
- specification respectively, materials weight;
- foundation loadings.

Maintenance manuals shall include at least:

- layout drawings of the steam turbine / alternator as-built;
- description of all parts of the steam turbine / alternator;
- check lists for periodic maintenance and inspection;
- clear description of all maintenance and inspection activities to be performed;
- list of recommended lubricants with equivalents;
- when available exploded views of parts purchased by the Contractor together with parts list.

Check lists shall include all maintenance activities and inspections which have to be performed periodically in order to maintain the safety and operating conditions of the steam turbine/alternator set.

Check lists shall be made for each different interval of time (daily, weekly, monthly, yearly) and running hours and indicate the location of each maintenance/inspection point together with the reference of the detailed escription included in the maintenance manual.

The KKS coding has to be the basis of the operation and maintenance manuals as well. This implies that the KKS code of a specific item is mentioned in the operation and maintenance instruction.

D.3.2.4 List of required utilities

Such as cooling water for alternator, oil, etc, and compressed air.

D.3.2.5 Pipe connection table

Pipe connection table shall include list of battery limits with details

D.3.2.6 Turbine control and protection cabinet

The description of the turbine control and protection cabinet shall include among other things descriptions of the alternator protection and measuring cabinet.

The description of the alternator protection cabinet shall contain among other things, the alternator conception concept and protective device settings.

D.3.2.7 Wiring diagram

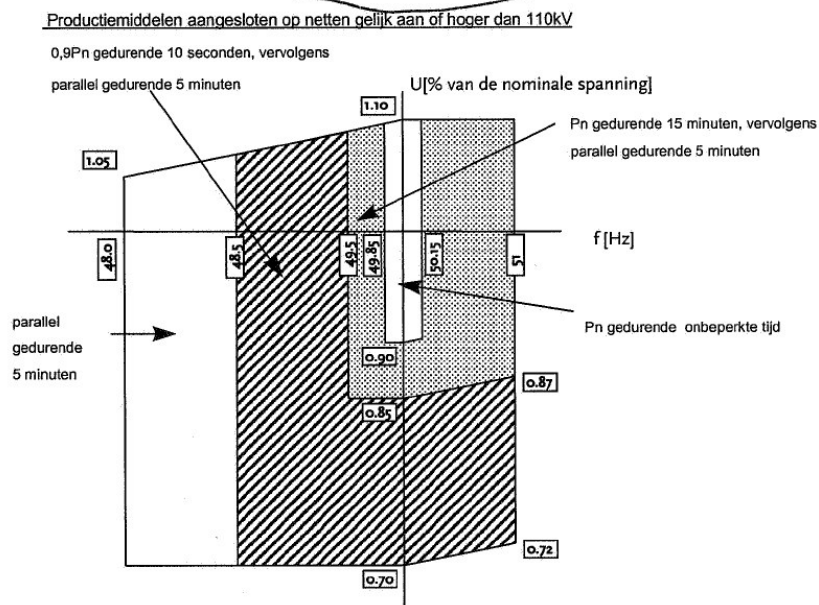
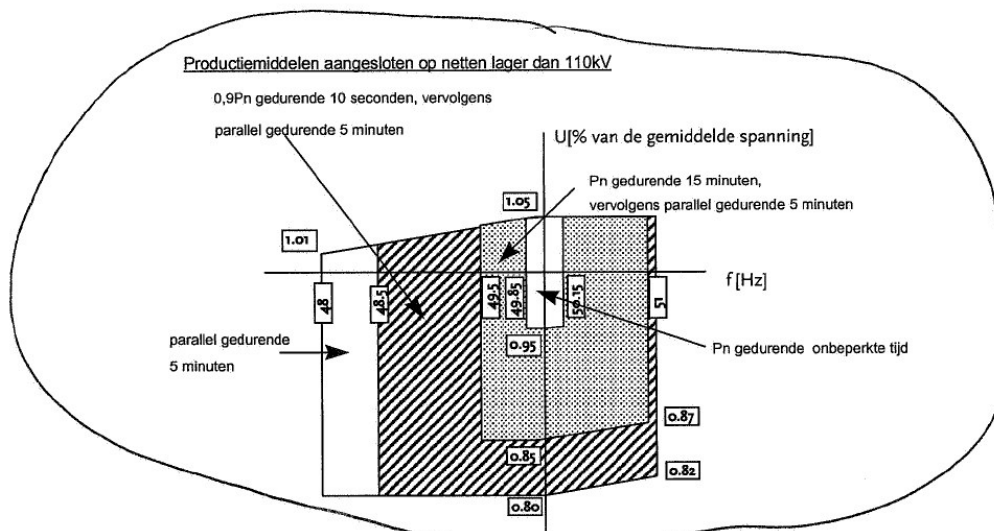
The wiring diagram shall include among other things the turbine control system, the turbine governor system, the turbine protection system and the I/O list.

Annex E 'Bijlage 3' from DTe "Systeemcode per 1 juli 2005"

Directie Toezicht Energie (DTe)

NMa

Bijlage 3: Bedrijfsituaties waarbij de generator gekoppeld dient te blijven met het net van de netbeheerder.

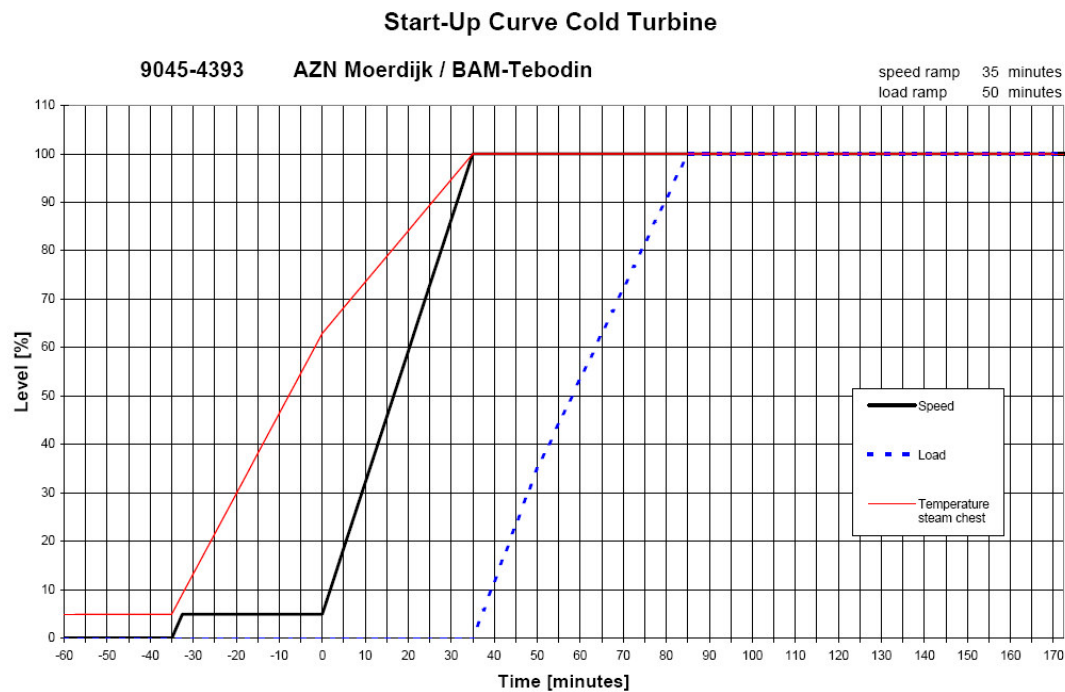


- 2.5.4.2 Productie-eenheden aangesloten op netten met een spanningsniveau van 50 kV en hoger kunnen bedrijf voeren met een arbeidsfactor tussen 1,0 en 0,8 (inductief) gemeten op de generatorklemmen.
- 2.5.4.3 Alle productie-eenheden aangesloten op netten met een spanningsniveau lager dan 50 kV kunnen bedrijf voeren met een arbeidsfactor tussen 1,0 en 0,85 (inductief) gemeten op de generatorklemmen.
- 2.5.4.4 Over de grenswaarden van de arbeidsfactor zoals genoemd in 2.5.4.2 en 2.5.4.3 vindt tijdig overleg plaats met de netbeheerder, zodat in overleg besloten kan worden tot afwijkende waarden, zodat ook capaciteif draaien mogelijk is.
- 2.5.4.5 De beschikbare capaciteit aan blindvermogen op het aansluitpunt zowel voor het opnemen uit als het leveren aan het net wordt eenmalig vastgesteld.
- 2.5.4.6 De productie-eenheden zoals bedoeld in 2.5.4.2 en 2.5.4.3 dienen bij verlaagde netspanning de met de netbeheerder afgesproken maximale hoeveelheid blindvermogen te kunnen leveren, gedurende de volgende tijdsperioden:

	Spanningsdaling	Tijdsperiode
Netten ≥ 110 kV	$U_n \geq U \geq 0.9 U_n$	Onbeperkt
	$0.9 U_n > U \geq 0.85 U_n$	15 minuten
	$0.85 U_n > U \geq 0.7 U_n$	10 seconden
Netten < 110 kV	$U_n \geq U \geq 0.95 U_n$	Onbeperkt
	$0.95 U_n > U \geq 0.85 U_n$	15 minuten
	$0.85 U_n > U \geq 0.8 U_n$	10 seconden

- 2.5.4.7 De spanningsstatiek van de spanningsregeling is instelbaar tussen 0 % en 10 %.
- 2.5.5 Sterpuntsbehandeling
- 2.5.5.1 De behandeling van het sterpunt van de productie-eenheid wordt bepaald door de netbeheerder in overleg met de beheerder van de productie-eenheid.
- 2.5.6 Kortsluitvermogen
- 2.5.6.1 In overleg met de netbeheerder wordt door berekeningen nagegaan of en zo ja door welke maatregelen, de bijdrage aan het kortsluitvermogen door de productie-eenheid redelijkerwijs kan worden beperkt.
- 2.5.7 De uitvoering van de installatie
- 2.5.7.1 De aandrijvende machine vertoont een rustig gedrag.
- 2.5.7.2 Indien de productie-eenheid niet direct is aangesloten op het net van de netbeheerder, is de bij het ontwerp aan de generator of de machinetransformator toe te kennen spanning afgestemd op de te verwachten gemiddelde bedrijfsspanning op het aansluitpunt en het gemiddelde spanningsverlies tussen de generator en het aansluitpunt. De spanningsafwijking ter plaatse van de generator is een afgeleide van de spanningsafwijking op het aansluitpunt.
- 2.5.7.3 Indien door de netbeheerder wordt verwacht dat de gemiddelde bedrijfsspanning in de toekomst beduidend zal wijzigen wordt hiermede bij het ontwerp van de installatie rekening gehouden.
- 2.5.7.4 Ten behoeve van – eventueel toekomstige – stabiliteitsberekeningen worden de volgende gegevens van generatoren bij levering overgelegd:
- het toegekende schijnbaar vermogen,

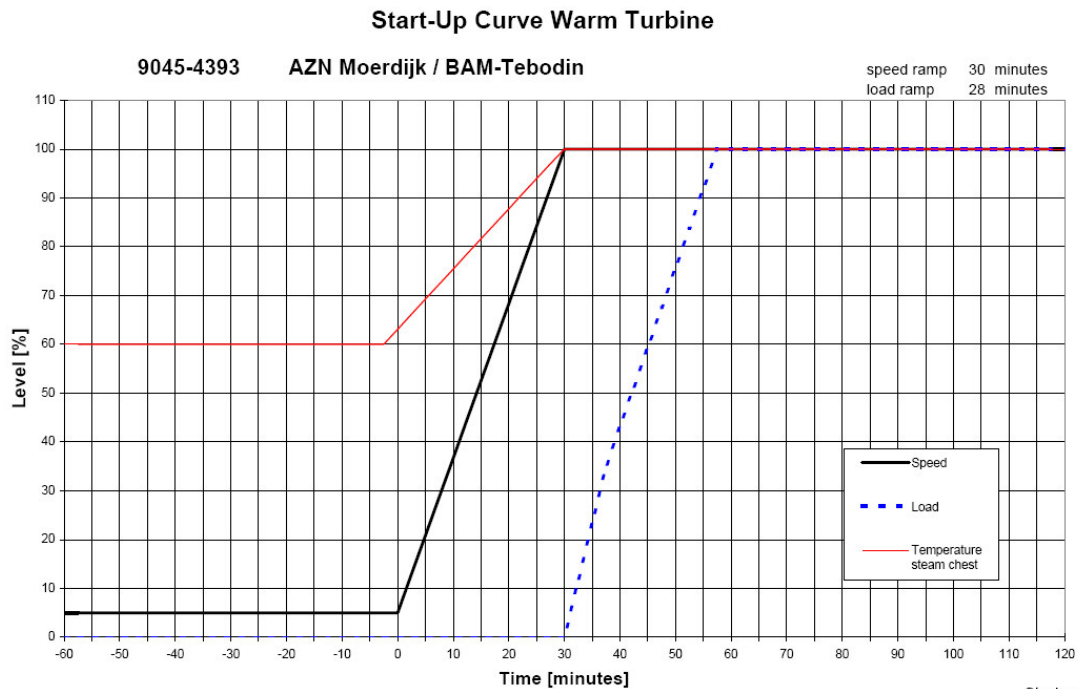
Annex G Start-up curves for the steam turbine



Steckner

MT50+MT10 / Version 4.11.2004

05.02.2007 - 17:47



Steckner

MT50+MT10 / Version 4.11.2004

05.02.2007 - 17:47

