

BAB III

METODOLOGI PERANCANGAN

3.1. Standar Perancangan yang digunakan

Standar yang digunakan untuk perancangan bejana tekan berdasarkan standar ASME Section VIII division 1. Khusus menentukan ketebalan *shell* menggunakan formula L.P Zick's.

3.2. Data Perancangan

Data perancangan yang digunakan berdasarkan bejana tekan yang sudah ada, yaitu bejana tekan *horizontal Open Drains Drum* yang terdapat di Qatar Petroleum, Bul Hanine Arab "C" Gas Cap Recycling.

3.2.1. Data Perancangan Bejana Tekan *Horizontal*

Sebelum merancang bejana tekan, terlebih dahulu menentukan data yang diambil dalam data *sheet* sebagai berikut :

1. Data Desain

- *Orientation* = *Horizontal*
- *Contents* = *HC, H2S, Water, Oxygen*
- *Critically Rating* = 3
- *Service* = *Lethal*
- *Design Code* = *ASME Sec.VIII DIV.1*
- *Code Stamp* = *Yes*
- *Temperatur*
 - a. *Design – Upper/Lower* = 100/4 (°C)
 - b. *Operating – Max/Normal/Min* = -/ 45 /- (°C)
- *Pressure*
 - a. *Design (Internal)* = 3,5 barg
 - b. *Design (External)* = -

c. <i>Operating – Max/Normal/Min</i>	= -/ 0.5 / - barg
– <i>Corrosion Allowance</i>	= 3 mm
– <i>Gross Capacity</i>	= 8 m ³
– <i>Vessel Diameter (ID)</i>	= 1450 mm
– <i>Vessel Length (T/L TO T/L)</i>	= 4350 mm
– <i>Shop Hydrotest Pressure (N&C)</i>	=Per Code
– <i>Wind</i>	=BS CP3, Chapter V, PART 2
– <i>Design Wind Speed</i>	= 45 m/s
– <i>Seismic (Refer Environmental Data)</i>	= 1535-0-56-0001
– <i>Shell Thickness (NOM)</i>	= 8 mm
– <i>Min.Head Thickness (Top/Bot)</i>	= 8 mm
– <i>Skirt Thickness/Height</i>	= -
– <i>Weld Joint Efficiencies</i>	
a. <i>Shell</i>	= 1
b. <i>Head</i>	= 1
– <i>Third Party Inspection</i>	= Yes
– <i>Non Destructive Testing</i>	
a. <i>Radiography</i>	= 100%
b. <i>Ultrasonic</i>	= as per code
c. <i>Magenetic Particle</i>	= 100%
d. <i>Dye Penetrant</i>	= Yes
– <i>Post Weld Heat Treatment</i>	= Yes
– <i>Material Impact Test Required</i>	= as per code
– <i>Insulation (By Others)</i>	= No
– <i>Fireproofing (By Others)</i>	= No
– <i>Painting (External)</i>	= ES-Q-12
– <i>Painting (Internal)</i>	= ES-Q-12

2. Construction

- *Type of Head* = 2:1 Ellipsoidal
- *Type of Support* = Saddle
- *Platform/Ladder/Pipe Clip* = Required
- *Insulation Supports* = Not Required
- *Manway Davit* = Required
- *Earthing Boss* = Required
- *Lifting Lugs/Eyes/Trunions* = Required
- *Name Plate* = Required, SS316

3. *Construction Material*

- *Shell* = SA516Gr60
- *Head* = SA516Gr60
- *Reinforcing pads* = SA516Gr60
- *Nozzle neck (pipes)* = SA516Gr.B
- *Forged flanges* = SA105
- *Welding Elbow* = SA234WPB
- *Baffles/Skimmer Plates* = SA516Gr60
- *Saddles (Wrapper plate/ribs)* = SA516Gr60/A283Gr.C
- *Internal attachments* = SA516Gr60
- *External attachments* = SA283Gr.C
- *External*
 - a. *Bolts* = SA 193 Gr B7
 - b. *Nuts* = SA 194 2H
- *Gaskets External* = Spiral wound
- *Gaskets Internal*
 - a. *Bolts* = SS316
 - b. *Nuts* = SS316

4. *Estimated Weight*

- *Empty* = 2.800 Kg
- *Shipping* = -
- *Operating* = 8.500 Kg

– *Field Test* = 10.800 Kg

5. *Nozzle Schedule*

– N1 = 4 in (150#)

– N2 = 6 in (150#)

– N3 = 2 in (150#)

– N4 = 6 in (150#)

– N5 = 2 in (150#)

– N6 = 2 in (150#)

– N7 = 2 in (150#)

– K1 A/B = 4 in (150#)

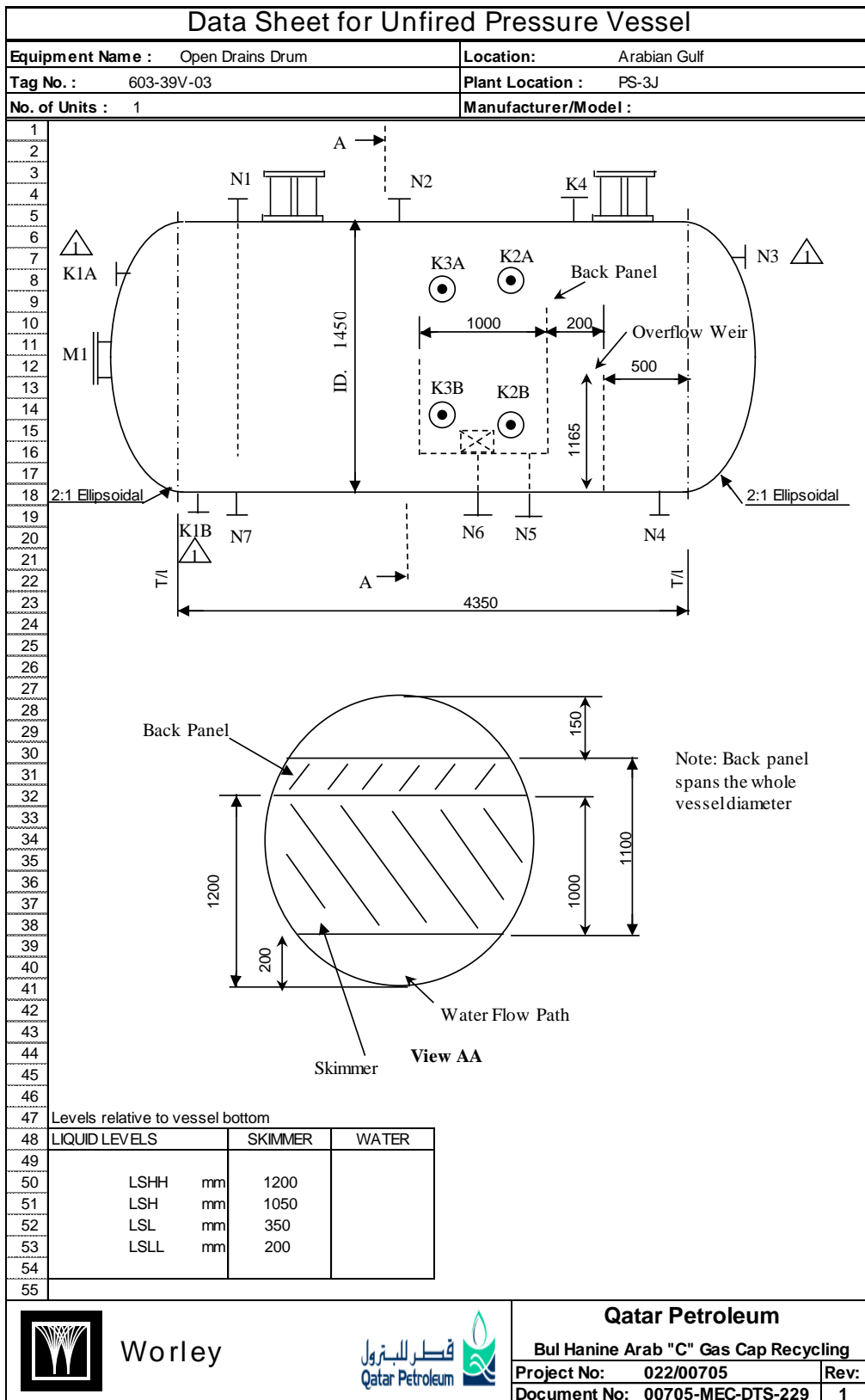
– K2 A/B = 4 in (150#)

– K3 A/B = 2 in (150#)

– K4 = 2 in (150#)

– M1 = 20 in (150#)

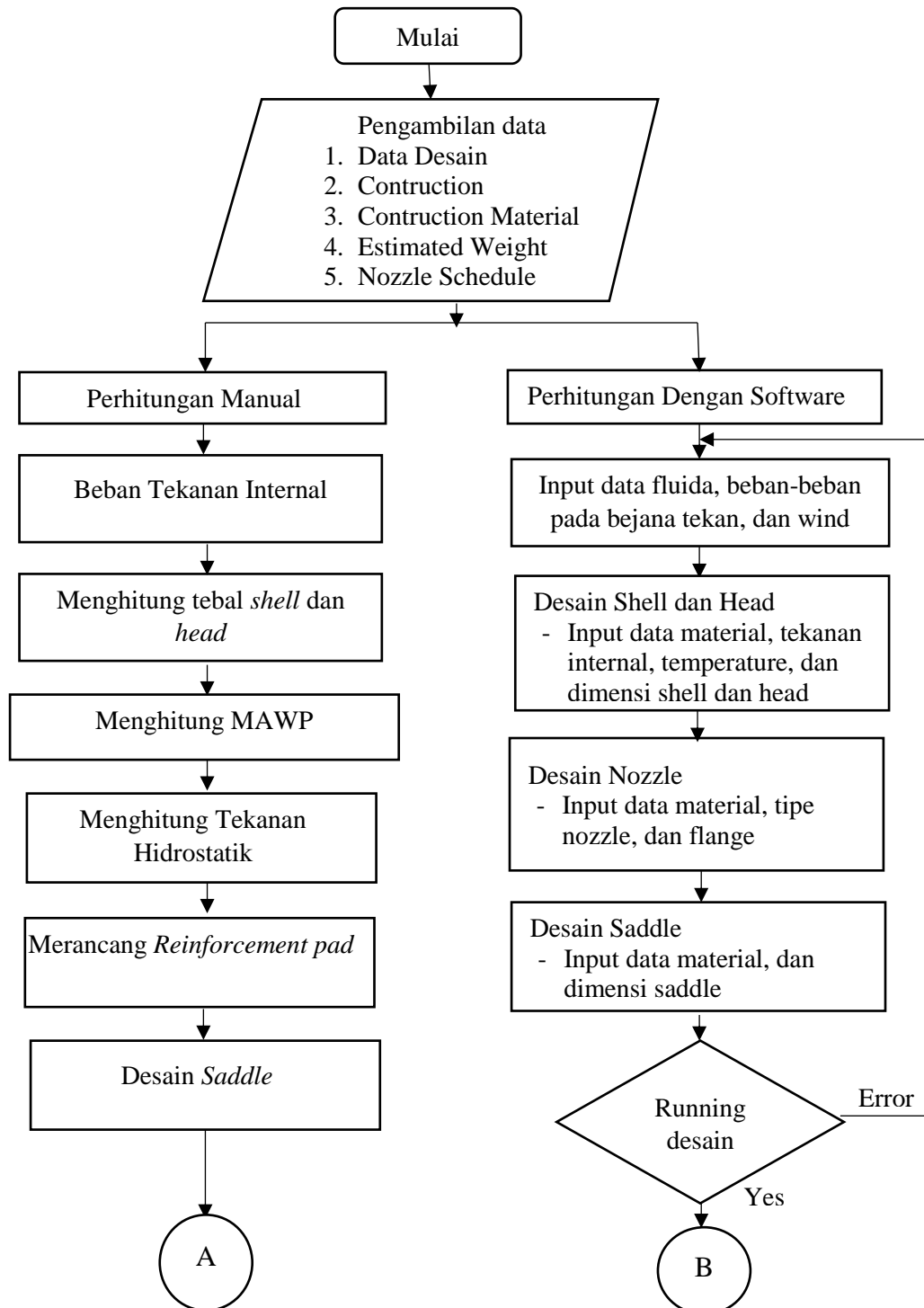
Lebih lengkapnya dapat dilihat pada data sheet (Lampiran 2.)



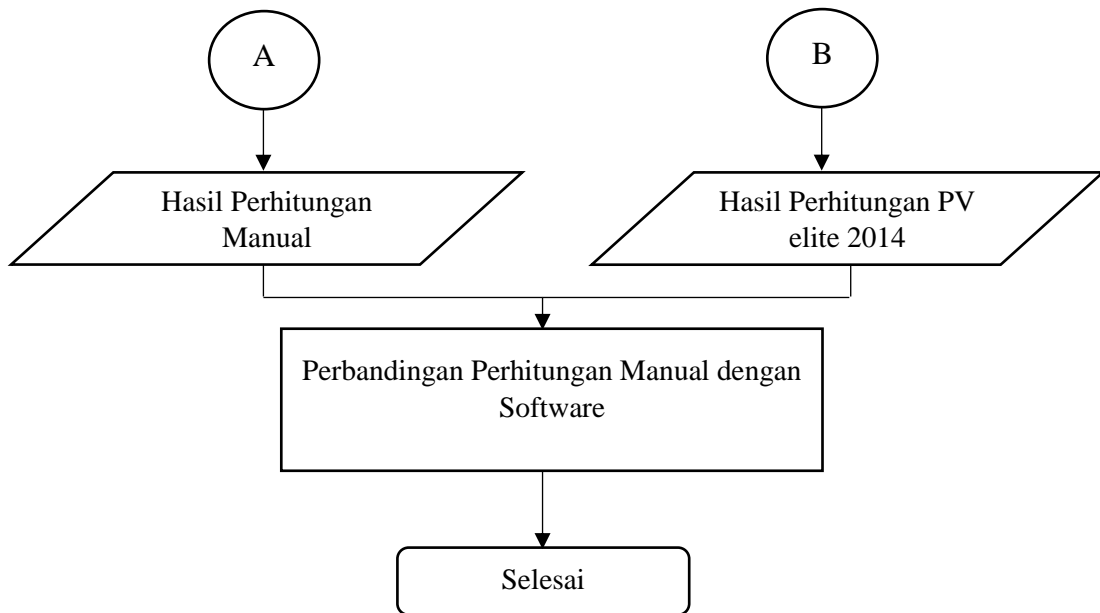
Gambar 3.1. Geometri Pressure Vessel Open Drains Drum

3.3. Diagram Alir (Flow Chart)

Dari data di atas dapat dibuat diagram alir perancangan bejana tekan ditunjukkan pada gambar 3.2.



Gambar 3.2. Diagram Alir Perancangan



Gambar 3.3. Diagram Alir Perancangan
(Lanjutan)