FINAL PROJECT - LS 1336

DESIGN OF LOADING - DISCHARGING AND RE-LIQUEFACTION SYSTEM ON PT. PUPUK SRIWIDJAJA 6000 m³ AMMONIA TANKER

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DEPARTMENT OF MARINE ENGINEERING
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TUGAS AKHIR - LS 1336

DESAIN SISTEM BONGKAR MUAT DAN SISTEM RE-LIQUEFACTION PADA TANKER AMMONIA 6000 m³ MILIK PT. PUPUK SRIWIDJAJA

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Surabaya 2009
ABSTRACT
DESIGN OF LOADING – DISCHARGING AND RE-LIQUEFACTION SYSTEM ON PT. PUPUK SRIWIDJAJA 6000 m³ AMMONIA TANKER

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Supervisor : Ir. Hari Prastowo, Msc

Abstract,

PT. Pupuk Sriwidjaja (PUSRI) would like to build new Ammonia Tanker to supply ammonia which is one of their side product. The ship designed has 119.30 m of Lpp, 20.40 m of Breadth, 8.30 m of Depth, 4.25 m of Draught and 6000 cbm capacity of cargo tank that is shared in two cargo tanks. This Final Project will deliver the design of ship’s loading – discharging and ammonia re-liquefaction systems. Loading – discharging process in Ammonia Tanker must be done with certain equipment and procedure, because the system will be operated in very low temperature and corrosive condition. Material that can be used in the pipping system and another equipments of loading – discharging process must be in accordance with Classification Society and codes requirements. So does the re-liquefaction plant which is used to change the ammonia vapour into the liquid phase, its must obedient the requirements with certain standarts to materials selection of the equipments that included in the re-liquefaction system. Phase changing of ammonia from liquid into gases is caused by high ambient temperature that transfered into the cargoes by the vessel’s hull and pressure increasing in the cargo tank that caused by ammonia which is change into the vapour state and give the pressure to the void space in the cargo tank.

Keyword : ammonia tanker, design, loading – discharging, re-liquefaction, equipments specification.
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Abstrak,
PT. Pupuk Sriwidjaja (PUSRI) berencana untuk membangun sebuah kapal tanker ammonia baru yang akan digunakan untuk mengangkut ammonia yang merupakan produk sampingan dari PUSRI. Kapal yang akan dibangun tersebut mempunyai dimensi Lpp 199.30 m, lebar kapal 20.40 m, tinggi kapal 8.30 m, sarat kapal 4.25 m serta mempunyai volume ruang muat 6000 m³ yang terbagi dalam dua ruang muat.. Tugas Akhir ini akan memberikan desain dari sistem bongkar muat dan re-liquefaction pada tanker ammonia tersebut. Sistem bongkar muat pada tanker ammonia harus dilakukan dengan menggunakan peralatan serta prosedur yang tepat karena sistem akan bekerja pada kondisi temperatur yang sangat rendah serta korosif. Material yang dapat digunakan dalam system perpipaan serta peralatan – peralatan lainnya dalam system bongkar muat harus memenuhi persyaratan – persyaratan klasifikasi. Begitu juga dengan system re-liquefaction yang merupakan system untuk mengubah ammonia yang berupa gas menjadi cair, harus memenuhi persyaratan pada klasifikasi yang sesuai dalam pemilihan material pada peralatan – peralatannya. Perubahan fase ammonia dari cair menjadi gas dapat disebabkan oleh tingginya temperatur luar yang merambat ke dalam muatan melalui lambung kapal. Penguapan ammonia ini dapat menimbulkan peningkatan tekanan dalam ruang muat yang dapat menyebabkan ledakan yang berbahaya.

Kata kunci : tanker ammonia, desain, bongkar muat, re-liquefaction, spesifikasi peralatan
LEGALITY SHEET

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FINAL PROJECT
This final project report submitted to the Department of Marine Engineering Faculty of Marine Technology Sepuluh Nopember Institute of Technology (ITS) Surabaya In partial fulfillment of the requirement for the Degree of Bachelor of Engineering (Sarjana Teknik)

Arranged by :

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JUNE, 2009
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ix
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Author realizes there are many mistakes in this Final Project. Therefore, hopefully reader can give suggestions and criticisms for this Final Project to develop a better Final Project afterwards.

Surabaya, June 2009

Author
LIST OF CONTENTS

Cover .................................................................................................................. i
Abstract ........................................................................................................ iii
Abstrak ........................................................................................................... v
Legality Sheet ................................................................................................. vii
Acknowledgements ....................................................................................... xi
List of Contents ............................................................................................ xiii
List of Figures ................................................................................................. xvii

CHAPTER I INTRODUCTION
1.1 Background ......................................................................................... I – 1
1.2 Problem Definition ........................................................................... I – 3
1.3 Constraints ......................................................................................... I – 3
1.4 Objectives ............................................................................................ I – 4
1.5 The Benefits of Final Project .......................................................... I – 4

CHAPTER II STUDY LITERATURE
2.1 Fundamental Concepts of Ammonia ........................................ II – 1
  2.1.1 Definition of Ammonia ........................................................ II – 1
  2.1.2 Characteristics of Ammonia ................................................. II – 1
2.2 Liquefaction of Ammonia Gases ................................................. II – 4
  2.2.1 Heat Transfers in Ammonia .............................................. II – 4
  2.2.2 Process of Gas Liquefaction ............................................. II – 6
2.3 Fundamental Concepts of Loading –
    Discharging and Gas Handling .................................................. II – 8
  2.3.1 Head in Ammonia Loading –
    Discharging System ........................................................ II – 8
  2.3.2 Ammonia Loading – Discharging
    Process .................................................................................. II – 11
  2.2.3 Ammonia Gas Handling ................................................ II – 12

CHAPTER III METHODOLOGY
3.1 Collecting Datas ............................................................................. III – 2
3.2 Process Flow Diagram of Loading –
    Discharging and Re-liquefaction System ...... III – 2
3.3 Owner Requirements ....................................................................... III – 2
3.4 Calculation Accoeding Owner Requirements . III – 3
3.5 Meet The Specification of System With Owner Requirements ........................................ III – 3
3.6 Detailed Calculation Involving Rules and Codes That Applied in The Vessel ................ III – 3
3.7 Meet Specification of System With Related Rules and Codes ....................................... III – 4
3.8 Basic Design of System ................................. III – 4
3.9 Final Checking and Revision ................................. III – 4
3.10 Final Design of System ................................. III – 4

CHAPTER IV DATA ANALYSIS AND CALCULATION

4.1 General ....................................................... IV – 1
4.2 System Designing and Equipments Determination ........................................ IV – 1

4.2.1 Designing Loading – Discharging System ........................................ IV – 1
   a). Design Conditions ....................................... IV – 4
   b). Calculation of Cargo Area
      Installation ........................................ IV – 8
   c). Head Calculation in Suction Side .... IV – 8
   d). Head Calculation in Discharge Side ........................................ IV – 9
   e). Cargo Pump That Required ........ IV – 10
   f). Loading – Discharging Valves ...... IV – 12

4.2.2 Designing Stripping System ........ IV – 13
   a). Design Conditions ....................................... IV – 13
   b). Calculation of Cargo Area
      Installation ........................................ IV – 16
   c). Head Calculation in Suction Side .... IV – 16
   d). Head Calculation in Discharge Side ........................................ IV – 18
   e). Stripping Pump That Required ...... IV – 20
   f). Stripping Valves ........................................ IV – 22

4.2.3 Designing Re-liquefaction System ...... IV – 24

4.2.3.1 Booster Pump Calculation .... IV – 25
   a). Design Conditions ........ IV – 25
b). Calculation of Cargo Area Installation .............. IV – 28
c). Head Calculation in Suction Side ................ IV – 29
d). Head Calculation in Discharge Side .......... IV – 30
e). Stripping Pump That Required ................ IV – 32
f). Stripping Valves ............... IV – 33

4.2.3.2 Vaporizer Calculation .......... IV – 34
4.2.3.3 Compressor Calculation ...... IV – 37
4.2.3.4 Condenser Calculation ........ IV – 41

4.3 Overview of equipments ................ IV – 44

CHAPTER V CONCLUSIONS AND RECOMMENDATION

5.1 Conclusions ........................................ IV – 1
5.2 Recommendation ................................... IV – 3

REFERENCES
APPENDIX
BIOBIBLIOGRAPHY
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LIST OF FIGURES

Figure 1. Picture of Ammonia Tanker .............................. I – 1
Figure 2. Process Flow Diagram of Loading –
   Discharging and Re-liquefaction System
   of Ammonia ...................................................... I – 3
Figure 3. Chemical Structure of Ammonia .......................II – 1
Figure 4. Triangular Pyramid of Ammonia .......................II – 2
Figure 5. Diagram of Horizontal Shell and Tube
   Ammonia Condenser ........................................II – 4
Figure 6. Horizontal Ammonia Receiver .........................II – 8
Figure 7. Fundamental Installation of Fluid Transfer .........II – 8
Figure 8. Flow Diagram of Ammonia in The Vessel ......II – 12
Figure 9. Equipments Involved in The Ammonia
   Re-liquefaction System .....................................II – 12
Figure 10. Flowchart of Final Project Execution Process ..III – 1
Figure 11. Process Flow Diagram of Loading –
   Discharging System ........................................IV – 3
Figure 12. Deepwell Cargo Pump .................................IV – 7
Figure 13. Process Flow Diagram of Re-liquefaction
   System ............................................................IV – 25