

Assignment Letter/Surat Tugas

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Dena Hendriana, B.Sc., S.M., Sc.D

Activity Assignment

Penugasan Kegiatan

Dean of the Faculty of Engineering and Information Technology

Dekan Fakultas Teknik dan Teknologi Informasi

In consideration of:

His appointment as the Dean of the Faculty of Engineering and Information Technology under agreement no. SK/017/Y-SGU/VIII/2018

Mengingat:

Pengangkatannya sebagai Dekan Fakultas Teknik dan Teknologi Informasi di bawah perjanjian no. SK/017/Y-SGU/VIII/2018

Herewith permits to

Dengan ini menugaskan kepada

Name/*Nama:*

Dena Hendriana, B.Sc., S.M., Sc.D

Position/*Jabatan:*

Head of Master of Mechanical Engineering Department/
Kepala Program Studi Magister Teknik Mesin

Faculty/*Fakultas:*

Engineering and Information Technology/ Teknik dan Teknologi Informasi.

To follow on the activity below:

Untuk mengikuti kegiatan berikut ini:

No	Activity / <i>Kegiatan</i>	Organizer / <i>Penyelenggara</i>	Day & Date / <i>Hari & Tanggal</i>	Venue / <i>Tempat</i>
1.	Penelitian Tank badak menjadi amphibus bekerja sama dengan PT. Pindad	Swiss German University	January 2021 – December 2021	Prominence Office Tower. Swiss German University

The Appointed shall accomplish the task in responsible ways in line with the related guidelines and other regulation given by SGU.

Pihak yang bersangkutan harus melaksanakan tugas dan tanggung jawab sebaik-baiknya, sesuai dengan petunjuk dan peraturan dari SGU.

Assignor / Pemberi Ijin:



Dr. Maulahikmah Galinium, S.Kom., M.Sc

Dean of Faculty Engineering and Information Technology
Dekan Fakultas Teknik dan Teknologi Informatika



SWISS GERMAN UNIVERSITY

LAPORAN

PENELITIAN MODIFIKASI TANK BADAK MENJADI AMPHIBIUS

BEKERJA SAMA DENGAN PT. PINDAD

Dena Hendriana, B.Sc., S.M., Sc.D – Team Leader

Keysha Zakri (PT. Pindad) – Team Member

Martin (PT. Pindad) – Team Member

MASTER OF MECHANICAL ENGINEERING

2021

Swiss German University

The Prominence Tower Alam Sutera

Jalan Jalur Sutera Barat No 15, Tangerang 15143

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Judul Penelitian : Penelitian Modifikasi Tank Badak menjadi Amphibious Bekerja Sama dengan PT. Pindad

Nama Team Leader : Dena Hendriana, B.Sc., S.M., Sc.D

Research Center/Dept. : Master of Mechanical Engineering

E-mail : dena.hendriana@sgu.ac.id

Mobile phone : 081213715844

Masa program : Januari – Desember 2021 (12 bulan)

Keterangan Aktifitas : PT. Pindad akan mengembangkan produk Tank Badak untuk menjadi Amphibious yang bisa bergerak di darat dan di perairan. Kegiatan penelitian ini di minta oleh PT. Pindad untuk melakukan analisa hydrostatics dan hydrodynamics untuk Tank Badak untuk bisa mengambang dengan stabil dan dapat bergerak di permukaan danau. Bekerja sama dengan team desain dari PT. Pindad, bentuk dan volume tank Badak yang mampu menjadi Amphibious dengan memenuhi kriteria dari hasil analisa hydrostatics dan hydrodynamics dapat dilakukan.

Kegiatan ini merupakan kegiatan pengabdian masyarakat dari Swiss German University yang memanfaatkan keilmuan akademik dari hydrostatics dan hydrodynamics untuk kebutuhan masyarakat yang disini adalah dari pihak Industri yaitu PT. Pindad.

Hasil dari penelitian ini tidak dipublikasikan dikarenakan kerahasiaan dari produk PT. Pindad.

Alam Sutera, Tangerang

Date: November 2021



Dena Hendriana, B.Sc., S.M., Sc.D

NIK: 11211528



AMPHIBIOUS BADAK TANK ANALYSIS

Summary Report on: April 2021

By:

Dr. Dena Hendriana

Swiss German University

Dr. Dena Hendriana

Swiss German University

Head of Master of Mechanical Engineering

- Education background:
 - B.Sc. in Mechanical Eng., Northeastern Univ., Boston, USA
 - S.M. in Mechanical Eng., Massachusetts Institute of Technology (MIT), Cambridge, USA
 - Sc.D in Mechanical Eng., MIT, Cambridge, USA
- Experiences:
 - Automotive Industry, USA ~ 14 years
 - Higher Education, Indonesia, since 2013

BADAK, PT. PINDAD

Current Specifications:

Weight = 14.1 Ton

Combat weight: 15,100 kg

Config: 6x6

Dim: LxWxH = 5.65 x 2.7 x 2.7 m

Crew: 3 persons

Range: 600 km

Speed: 80 km/h on high way

Diesel 6 Cyl, 340 HP Turbo Charger Intercooler



Overall Project: Amphibious Badak Project

Project Steps:

1. Determination of vehicle configuration
 - Number of personels, Loads, Vehicle configuration
2. Determination of components and total weight
 - Engine, Wheels, etc.
3. Determination of vehicle total center of gravity
4. Vehicle static floating attitude calculation and design
5. Vehicle static floating stability analysis
6. Dynamic analysis of vehicle water resistance characteristic
7. Propulsion analysis and design
8. Vehicle speed calculation
9. Vehicle water entry analysis (need entry specification)
10. Wave protection design
11. Cannon firing effect estimation on static vehicle
12. Cannon firing effect estimation on moving vehicle
13. Verification on scaled model test (in ITS)
 - Vehicle attitude, static stability, water entry, water resistance?
14. Prototyping and test (in Pindad)
 - Leaks, vehicle speed, wave protection, cannon firing?
15. Prototype improvements (in Pindad)

Design (AutoCAD) function:

- Weight estimate
- Location of center of gravity

CFD function:

- Vehicle static floating attitude calculation
- Vehicle static floating stability analysis
- Dynamic analysis of vehicle water resistance characteristic
- Propulsion analysis
- Vehicle water entry analysis
- Wave protection design
- Cannon firing effect estimation on static vehicle
- Cannon firing effect estimation on moving vehicle

Scaled model function:

- Verification on vehicle static floating attitude and stability
- Verification on vehicle water entry and wave protection

Prototype function:

- Leak study
- Verification on vehicle speed, etc.
- Improvements

Current Project: Amphibious Badak Analysis

Analysis Steps:

1. Determination of vehicle configuration
 - Number of personels, Loads, Vehicle configuration
2. Determination of components and total weight
 - Engine, Wheels, etc.
3. Determination of vehicle total center of gravity
4. Vehicle static floating attitude calculation and design
5. Vehicle static floating stability analysis
6. Dynamic analysis of vehicle water resistance characteristic