RANCANGAN *SPECIAL TROLLEY* SEBAGAI *EQUIPMENT* PENUNJANG PEKERJAAN PERAWATAN PESAWAT

TUGAS AKHIR

Oleh :

MOCH BIMA AWWALUDIN
NIT. 30418062

PROGRAM STUDI DIPLOMA 3 TEKNIK PESAWAT UDARA

POLITEKNIK PENERBANGAN SURABAYA

2021

RANCANGAN SPECIAL TROLLEY SEBAGAI EQUIPMENT PENUNJANG PEKERJAAN PERAWATAN PESAWAT

TUGAS AKHIR

Diajukan sebagai Salah Satu Syarat untuk Mendapatkan Gelar
Ahli Madya (A.Md.) pada Program Studi Diploma 3 Teknik Pesawat Udara

Oleh :

MOCH BIMA AWWALUDIN
NIT. 30418062

PROGRAM STUDI DIPLOMA 3 TEKNIK PESAWAT UDARA

POLITEKNIK PENERBANGAN SURABAYA

2021

LEMBAR PERSETUJUAN

RANCANGAN *SPECIAL TROLLEY* SEBAGAI *EQUIPMENT* PENUNJANG PEKERJAAN PERAWATAN PESAWAT

Oleh :

MOCH BIMA AWWALUDIN
NIT. 30418062

Disetujui untuk diujikan pada :

Surabaya , 19 Agustus 2021

Pembimbing I : CHOLIK SETIJONO, S.SiT, MM ……..
NIP. 19701109 201601 08 009

Pembimbing II : SUYATMO, ST, SPd, MT, MPd ……..
NIP. 196305010 198902 1001

PROGRAM STUDI DIPLOMA 3 TEKNIK PESAWAT UDARA
POLITEKNIK PENERBANGAN SURABAYA
2021

LEMBAR PENGESAHAN

RANCANGAN *SPECIAL TROLLEY* SEBAGAI *EQUIPMENT* PENUNJANG PEKERJAAN PERAWATAN PESAWAT

Oleh :

MOCH BIMA AWWALUDIN
NIT. 30418062

Telah dipertahankan dan dinyatakan lulus pada sidang proposal tugas akhir
Program Pendidikan Diploma III Teknik Pesawat Udara
Politeknik Penerbangan Surabaya
Pada tanggal : 19 Agustus 2021

Panitia Penguji :

1. Ketua : MOCH RIFAI, ST, M.Pd ……
   NIP. 19770216 199903 1 003
2. Sekretaris : SUSENO, S.T, MM ……
   NIP. 19680717 2016010 8 001
3. Anggota : CHOLIK SETIJONO, S.SiT, MM ……
   NIP. 19701109 201601 08 009

Ketua Program Studi
TEKNIK PESAWAT UDARA

BAMBANG JUNIPITOYO, ST, MT.
Penata Muda Tk I (III/b)
NIP. 19780626 200912 1 001

MOTTO

Tidak ada yang tidak mungkin selama ada niat dan kemauan
Apapun bisa dilakukan

ABSTRAK

RANCANGAN *SPECIAL TROLLEY* SEBAGAI *EQUIPMENT* PENUNJANG PEKERJAAN PERAWATAN PESAWAT

Oleh :

MOCH BIMA AWWALUDIN
NIT. 30418062

Salah satu *Human factor* adalah *Fatigue*. Hilangnya kesadaran menurunkan kualitas pekerjaan perawatan pesawat. Karena adanya Human factor kualitas pekerjaan perawatan pesawat menjadi menurun dan dapat menyebabkan *accident* dan *incident* pada pesawat terbang. Hal ini dapat menurunkan kualitas pekerjaan perawatan pesawat.

Metode Penelitian pada perancangan *Special Trolley* adalah dengan melakukan Identifikasi masalah, mencari studi pustaka agar mendapatkan lebih banyak teori tentang perancangan produk, mengumpulkan data yang akan di analisa agar memecahkan suatu masalah agar mendapatkan suatu rancangan yang dapat diterima oleh *Customer*. Dari *Customer Needs* tersebut akan dibuat respon teknis terkait alat yang akan dirancang.

Hasil dari konsep rancangan *Special Trolley* sudah sesuai dengan kebutuhan dan keinginan dari *Customer* sehingga alat ini dapat digunakan pada saat melakukan pekerjaan perawatan pesawat. Pada rancangan *Special Trolley* terdapat sebuah tempat penyimpanan untuk dokumen seperti *Taskcard* dan *Aircraft Maintenance Manual*. Selain sebagai alat untuk membawa *Tools* pada saat melakukan pekerjaan perawatan pesawat, rancangan ini dapat digunakan sebagai tempat untuk meletakan komponen dari *Engine* pesawat. Dengan desain yang ergonomis menjadikan rancangan *Special Trolley* nyaman saat digunakan.

Kata kunci : *Human Factor, Customer Needs, Fatigue*, Perawatan Pesawat.

ABSTRACT

DESIGN OF SPECIAL TROLLEY AS EQUIPMENT SUPPORT TO AIRCRAFT MAINTENANCE WORK

Oleh :

MOCH BIMA AWWALUDIN
NIT. 30418062

Human Factor is Fatigue. Loss of awareness decreases the quality of aircraft maintenance work. Due to the Human factor, the quality of aircraft maintenance work has decreased and can cause accidents and incidents on aircraft. This can reduce the quality of aircraft maintenance work.

The research method in designing the Special Trolley is to identify problems, look for literature studies to get more theories about product design, collect data that will be analyzed in order to solve a problem in order to get a design that is acceptable to the customer. From the Customer Needs, I will give a technical response regarding the tools to be designed.

The results of the Special Trolley design concept are in accordance with the needs and desires of the customer so that this tool can be used when carrying out aircraft maintenance work. In the Special Trolley design, there is a storage area for documents such as a Taskcard and Aircraft Maintenance Manual. Apart from being a tool for carrying tools when carrying out aircraft maintenance work, this design can be used as a place to place components of the aircraft engine. With an ergonomic design, the Special Trolley design is comfortable to use.

Keywords: Human Factor, Customer Needs, Fatigue, Aircraft Maintenance.

PERNYATAAN KEASLIAN DAN HAK CIPTA

Saya yang bertanda tangan di bawah ini :

Nama	: Moch Bima Awwaludin
NIT	: 30418062
Program Studi	: D III Teknik Pesawat Udara
Judul Tugas Akhir	: RANCANGAN *SPECIAL TROLLEY* SEBAGAI *EQUIPMENT* PENUNJANG PEKERJAAN PERAWATAN PESAWAT

Dengan ini menyatakan bahwa :

1. Tugas Akhir ini merupakan karya asli dan belum pernah diajukan untuk mendapatkan gelar akademik , baik di Politeknik Penerbangan Surabaya maupun di Perguruan Tinggi lain , serta dipublikasikan, kecuali secara tertulis dengan jelas dicantumkan sebagai acuan dalam naskah dengan disebutkan nama pengarang dan dicatumkan dalam daftar pustaka.

2. Demi pengembangan ilmu pengetahuan, menyetujui untuk memberikan Hak Bebas Royalti Non Eksklusif (Non-Exclusive Royalty-Free Right) kepada Politeknik Penerbangan Surabaya umkana nama saya sebagai penulis/pencip besertaant perrangkat (jika diperlukan). Dengan Hak ini, Politeknik Penerbangan Surabaya berhak menyimpan, mengalih media/formatkan, mengelola dalam bentuk pangkalan data (database), merawat, dan mempublikasikan tugas akhir saya dengan tetap mencantumkan nama saya sebagai penulis/pencipta dan sebagai pemilik Hak Cipta.

Demikian pernyataan ini saya buat dengan sebenarnya. Apabila dikemudian hari terdapat penyimpangan dan ketidakbenarran, maka saya bersedia menerima sanksi akademik berupa pencabutan gelar yang telah diperoleh, serta sanksi lainnya sesuai dengan norma yang berlaku di Politeknik Penerbangan Surabaya.

Surabaya, 22 September 2021
Yang membuat pernyataan

MOCH BIMA AWWALUDIN
NIT.30418062

KATA PENGANTAR

Segala puji dan syukur penulis panjatkan kepada Tuhan Yang Maha Esa atas segala Rahmat dan Karunia-Nya yang telah memberikan kesehatan, pengetahuan, keterampilan, pengalaman yang senantiasa diberikan kepada penulis, sehingga penulis dapat menyelesaikan proposal tugas akhir dengan cukup baik yang berjudul **"RANCANGAN *SPECIAL TROLLEY* SEBAGAI *EQUIPMENT* PENUNJANG PEKERJAAN PERAWATAN PESAWAT"**.

Selama proses penyusunan proposal tugas akhir ini banyak menerima bantuan, bimbingan dan pengarahan dari berbagai pihak, maka pada kesempatan ini penulis mengucapkan terimakasih kepada :

1. Bapak M. Andra Aditiyawarman S.T, M.T, selaku Direktur Politeknik Penerbangan Surabaya.
2. Bapak Drs. Sudjud Prajitno, S.SiT. selaku Quality Assurance AMTO 147/1000.
3. Bapak Bambang Junipitoyo, ST, MT, selaku Ketua Program Studi Teknik Pesawat Udara di Politeknik Penerbangan Surabaya.
4. Bapak Cholik Setijono, S.SiT, MM. selaku Dosen Pembimbing Materi Tugas Akhir.
5. Bapak Suyatmo, ST.SPd, MT, MPd. selaku Dosen Pembimbing penulisan proposal tugas akhir.
6. Seluruh dosen dan civitas akademika Program Studi Teknik Pesawat Udara Politeknik Penerbangan Surabaya.
7. Kepada Orang tua, serta saudara yang telah memberikan doa serta bantuan untuk kelancaran proposal tugas akhir ini.
8. Rekan-rekan D III Teknik Pesawat Udara angkatan IV yang selalu memberikan motivasi.

Penulis menyadari bahwa masih terdapat kekurangan dalam penyusunan tugas akhir ini. Penulis berharap semoga penulisan ini dapat dikembangkan dan dapat bermanfaat bagi semua pihak.

Surabaya, 19 Agustus 2021

MOCH BIMA AWWALUDIN
NIT. 30418062

DAFTAR ISI

Halaman

DAFTAR GAMBAR

Halaman

DAFTAR TABEL

Halaman

DAFTAR LAMPIRAN

Halaman

DAFTAR PUSTAKA

McCann, Robert S., Spirkovska, Lilly. (2011). Human Factor. Dalam *Addedum handbook AMT* (pp. 319-337): System Health Management: With Aerospace Applications

Weman, Klas. (2003). *Welding Process Handbook.*

Cohen, Lao. (1995). *Quality Function Deployment: How to Make QFD Work for You.* Addison-Wesley: University of Michigan.

Ulrich, Karl T. and Steven D. Eppinger. *Product Design and Development*. Fifth Edition, New York : McGraw-Hill, Inc, 2012

Batan, I Made Loden. *Desain Produk*. Penerbit Guna Widya, 2012

Prayogo, Ichtiar Firmansyah. (2020). RANCANG BANGUN SPECIAL TROLLEY PERALATAN PERAWATAN PESAWAT DI POLITEKNIK PENERBANGAN SURABAYA.

Handrian, Hadi, Dini Endah Setyo Rahaju, dan Edy Martinus Sianto. (2009). PERANCANGAN KERETA BELANJA PADA SUPERMARKET.

Driyantama, Satria. (2018). PEMBUATAN TROLLEY LIPAT SEBAGAI ALAT BANTU ANGKUT BARANG.

M. N. Nurrasjid. (2011). PENERAPAN SISTEM MANAJEMEN KESELAMATAN (SMS) DI BANDAR UDARA SPINGGAN BALIKPAPAN. *Jurnal Penelitian Perhubungan Udara Vol.37 No.4, Desember 2011*

Asianpaints (2020) *Painting Process* Diambil dari https://www.asianpaints.co.id/resources/learn/petunjuk-pengecatan-rumah/painting-process-metal-surfaces.html

Samidi. (2019). *MACAM MACAM TROLLEY DAN FUNGSINYA DI PABRIK INDUSTRI*. Diambil dari https://samiinstansi.blogspot.com/2019/12/macam-macam-trolley-dan-fungsinya-dipabrikindustri.html

Ibeng, Parta. (2018). Pengertian Besi, Rumus KimiaBesi, dan Sifatnya.Diambil dari https://pendidikan.co.id/pengertian-besi-rumus-kimia-besi-dan-sifatnya/

Besi. (2018). Diambil 24 Desember 2020,dari https://ms.m.wikipedia.org/wiki/Besi

Siswanta. (2016). *Alat-alat Mesin (Power Tool)*. Cilacap. Diambil dari https://slideplayer.info/slide/3647843/

Klikmro. (2017). Jenis-jenis Mesin Gerindra Beserta Fungsinya. Diambil dari https://blog.klikmro.com/ketahui-fungsi-setiap-jenis-mesin-gerinda/

LAMPIRAN

CASR PART 19.1

19.1 Definitions

For the purpose of this regulation, the term :

1. Accident means an occurrence associated with the operation of an aircraft which takes place between the times any person boards the aircraft with the intention of flight until such time as all such persons have disembarked, in which:
   (1) a person is fatally or seriously injured as a result of:
      (i) being in theaircraft, or
      (ii) direct contact with any part of the aircraft, including parts which have become detached from the aircraft, or
      (iii) direct exposure to jet blast, except when the injuries are from natural causes, self-inflicted or inflicted by other persons, or when the injuries are to stowaways hiding outside the areas normally available to the passengers and crew; or
   (2) The aircraft sustains damage or structural failure which:
      (i) adversely affects the structural strength, performance or flight characteristics of the aircraft, and
      (ii) would normally require major repair or replacement of the affected component, except for engine failure or damage, when the damage is limited to the engine, its cowlings or accessories; or for damage limited to propellers, wing tips, antennas, tires, brakes, fairings, small dents or puncture holes in the aircraft skin; or
   (3) the aircraft is missing or is completely inaccessible.
2. Acceptable level of safety performance (ALoSP) means minimum level of safety performance of a service provider, as defined in its safety management system, expressed in terms of safety performance targets and safety performance indicators.

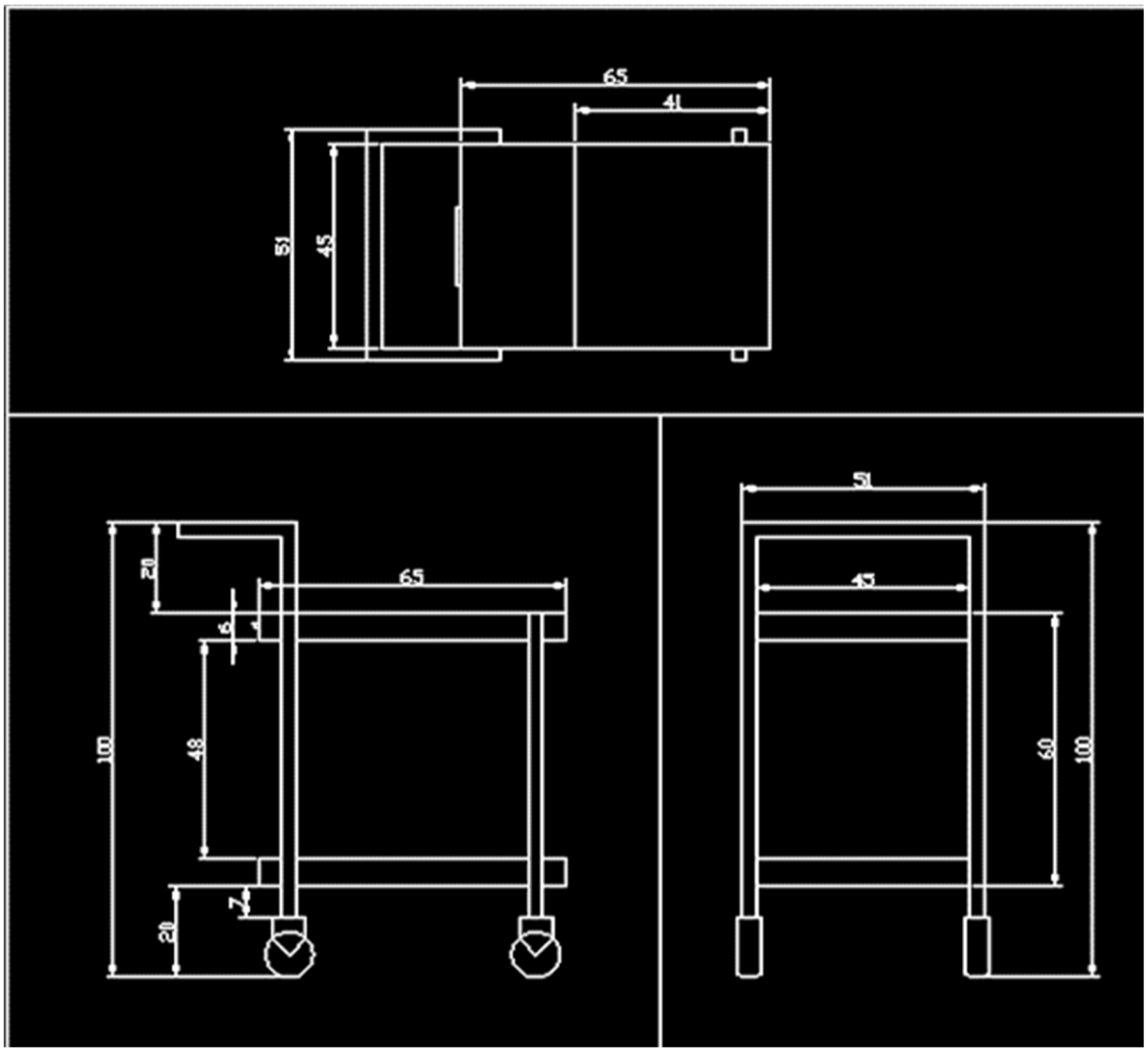
3. Accountability means obligation or willingness to account for one's actions.
4. Accountable Executive means a single, identifiable person which might be a Chief Executive Officer, a Chairperson Board of Directors, a partner or a proprietor who has full responsibility for the organization's SMS and have full authority for human resources issues, major financial issues, direct responsibility for the conduct of the organization's affairs, final authority over operations under certificate, and final responsibility for all safety issues.
5. Aircraft means any machine that can derive support in the atmosphere from the reactions of the air other than the reactions of the air against the earth's surface;
6. Anonymisation means the removal from occurrence reports of all personal details relating to the reporter and to the persons mentioned in occurrence reports and any details, including the name of the organization (s) involved in the occurrence, which may reveal the identity of the reporter or of a third party or lead to that information being inferred from the occurrence report;
7. Aviation personnel is certified personnel, assigned and responsible in aviation.
8. Consequence means potential outcome(s) of the hazard.
9. Disidentified information means information arising from occurrence reports from which all personal data such as names or addresses of natural persons have been removed;
10. Hazard means condition, object or activity with the potential of causing injuries to personnel, damage to equipment or structures, loss of material, or reduction of ability to perform a prescribed function.
11. Incident an occurrence, other than an accident, associated with the operation of an aircraft which affects or could affect the safety of operation.
12. Just culture means a culture in which front-line operators or other persons are not punished for actions, omissions or decisions taken by them that are commensurate with their experience and training, but in which gross negligence, willful violations and destructive acts are not tolerated;

13. Komite Nasional Keselamatan Transportasi (KNKT) is the permanent national transportation safety investigation authority conducting or supervising safety investigations;
14. Mitigation means measures to address the potential hazard or to reduce the risk probability or severity.
15. Predictive means a method that captures system performance as it happens in real-time normal operations.
16. Proactive means the adoption of an approach which emphasizes prevention through the identification of hazards and the introduction of risk mitigation measures before the risk-bearing event occurs and adversely affects safety performance.
17. Probability means the likelihood that an unsafe event or condition might occur.
18. Reactive means the adoption of an approach where safety measurement is as a responds to the events that already happened, such as incidents and accidents.
19. Reporter means a natural person who reports an occurrence or other safety-related information pursuant to this regulation;
20. Risk means the assessment, expressed in terms of predicted probability and severity, of the consequence(s) of a hazard taking as reference the worst foreseeable situation.
21. Risk management means the identification, analysis and elimination, and/or mitigation to an acceptable level of risks that threaten the capabilities of an organization.
22. Safety means the state in which the risk of harm to persons or property damage is reduced to, and maintained at or below, an acceptable level through a continuing process of hazard identification and risk management.
23. Safety assessment means a systematic analysis of a proposed change to equipment or procedures to identify and mitigate weaknesses before change is implemented.
24. Safety assurance means what the service providers do with regard to safety performance monitoring and measurement.
25. Safety audit means what the Civil Aviation Authority performs with regard to its safety programme, and the service providers perform with regard to the SMS.

26. Safety Management System (SMS) means a systematic approach to managing safety, including the necessary organizational structures, accountabilities, policies and procedures.
27. Safety manager means a person who is responsible for providing guidance and direction for the operation of the organization's safety management system.
28. Safety oversight means the activities of Civil Aviation Authority as part of its safety programme, performed with regard to the service providers SMS, in order to confirm the organization's continuing fulfillment of its corporate safety policy, objectives, goals and standards.
29. Safety performance indicator means established objectives of a services provider SMS, linked to major components of a services provider SMS, and expressed in numerical terms.
30. Safety performance monitoring means the activities of a service provider as part of its SMS, in order to confirm the organization's continuing fulfilment of its corporate safety policy, objectives, goals and standards.
31. Safety performance target means medium or long-term objectives of a services provider SMS, determined weighing what is desirable and what is realistic for an individual services provider, and expressed in numerical terms.
32. Safety policy means a statement reflecting the organization's philosophy of safety management, and become the foundation on which the organization's SMS is built. The safety policy outlines the methods and processes that the organization will use to achieve desired safety outcomes.
33. Safety programme means an integrated set of regulations and activities aimed at improving safety.
34. Safety requirement means the operational procedures, technology, systems and programmes to which measures of reliability, availability, performance and/or accuracy can be specified are needed to achieve the safety performance indicators and safety performance targets.
35. Serious incident an incident involving circumstances indicating that an accident nearly occurred.

36. Service provider means approved/ certificated organizations providing aviation services
37. Severity means the possible consequences of an unsafe event or condition, taking as reference the worst foreseeable situation.
38. State Safety Programme means an integrated set of legal acts and activities aimed at managing civil aviation safety in the State;
39. System means organized set of processes and procedures.
40. Systematic means that safety management activities will be conducted in accordance with a pre-determined plan, and applied in a consistent manner throughout the organization.

Gambar Teknik Rancangan *Special Trolley*



DAFTAR RIWAYAT HIDUP

MOCH BIMA AWWALUDIN, lahir di Surabaya pada tanggal 5 juli 1999. Anak pertama dari tiga bersaudara pasangan bapak Moch. Kohar dan ibu Indri Tikno Prijatiningsih. Bertempat Tinggal di JL. Tengger Kandangan 2 No.10 Kecamatan Benowo, Surabaya, Jawa Timur. Memulai Pendidikan di SD Simomulyo VII pada tahun 2006 dan lulus pada tahun 2012. Melanjutkan Sekolah Menengah Pertama di SMP Negeri 4 Surabaya pada tahun 2012 dan lulus tahun 2015. Melanjutkan Sekolah Menengah Atas di SMA Sejahtera Surabaya pada tahun 2015 dan lulus pada tahun 2018. Selanjutnya pada tahun 2018 lolos Seleksi dalam Program Beasiswa Teknik Pesawat Udara yang dilaksanakan oleh Pemerintah Kota Surabaya sebagai taruna di Politeknik Penerbangan Surabaya pada Program Studi Teknik Pesawat Udara Angkatan IV sampai Saat ini.

Mempunyai keahlian dalam memperbaiki Laptop dan Handphone. Membuka usaha kecil di rumah dalam masa pandemic Covid-19 yaitu Service Laptop dan Handphone. Mempunyai keahlian dalam mengedit video dan foto menggunakan sony vegas pro dan photoshop.