IJNRD.ORG ISSN : 2456-4184
INTERNATIONAL JOURNAL OF NOVEL RESEARCH AND DEVELOPMENT (IJNRD) | IJNRD.ORG
An International Open Access, Peer-reviewed, Refereed Journal

ADVANCEMENT IN ANTI-RADIATION MISSILES

[1]Rahul Sharma, [2]Dr. Vikas Bansal

[1]Final Year B-tech Student, [2]Associate Professor
[1]Mechanical Engineering,
[1]University Department, Rajasthan Technical University, Kota, India

Abstract : Anti-radiation-missile (ARM) is a weapon for detecting, interference and destroying radar and electronic facilities of the enemy. In last two decades with development in science and technology worldwide across the globe, Anti-radiation-missile (ARM) techniques obtained new breakthrough, in the wars i.e, cold war and in Ukraine and Russian war. In last decade India had done extremely good in developing the first Anti-Radiation missile of the country RUDRAM-1 designed by DRDO (Defence Research and Development Organization) along with ARDE (Armament Research and Development Establishment, DLRL (Defence Electronics Research Laboratory), and HEMRL (High energy material laboratory). Many of the works are done by the private firms. SDI (Software development institute) of Indain Air Force helps DRDO to deploy the missile into the Sukhoi (Su-30MKI).

IndexTerms **- Rudram-1**

INTRODUCTION

Anti-radiation-missile (ARM) is a "hammer kill" electronic attacking weapon, which targets radars and sources of radiations. Mainly it firstly detects the radars and electronic radiation sources and then it identifies. After this it automatically locates and hit the target.

- Detects
- Identify
- Locate
- Hit (attack)

High accuracy of the missiles is ensured by active decoy technology. It is important to analyze anti-radiation missiles, active decoy, guidance, and controlling technology for effective and accurate hitting on the target radars and other electronic equipment of the enemy.

First anti-radiation missile of India

Rudram-1 meaning remover of sorrows
Defence Research and Development Organization (DRDO) developed the first anti-radiation air- to-surface missile of India. It is basically meant for constraint of enemy air defences, which can be launched from a distance for destroying enemy and there defence systems. **Rudram-1** is the first missile developed of the category and will be jointly produced by Bharat dynamics limited (BDL) and Bharat Electronic limited (BEL).

Fig: Rudram-1

Designed by DRDO and Manufactured by the Bharat Dynamic Limited and some other works has been done by private partners. Range of the first ARM (anti-radiation-missile) developed by DRDO is around 100-250 km which is made to integrated on the Sukhoi Su-30MKi as the first testing platform, now it can be used with other fighter plane also like Dassault Mirage 2000, Jaguar, HAL, Tejas etc. in near future.

Rudram-1 is a single stage, around 5.5 m in long and 600 kg of weight. The DRDO ARM can also target mobile integrated air defence system as radar station.

Development of **Rudram-1** had begun by 2012 April at Defence Research and Development Laboratory (DRDL). The project approved in December 2012 with a budget of 317.2 crore. In 2014 the collaboration with Indian Air Force took place. The Captive Flight Trial-1 of DRDO ARM was completed on April/May 2016 by squadron 20 of Indian Air Force which took a trial of seeker, navigation, and control system.

The DRDO Anti-Radiation missile was officially named Rudram-1 on 9 October 2020. The latest testing of the Anti-radiation missile Rudram-1 is done in 2022, it is a successful flight test in Wheeler Island off the coast of Odisha. The missile was launched from SU-30 MKI fighter aircraft.

The **Rudram-1** is first indigenous anti-radiation of the country for IAF, being developed by Defence Research and Development Organisation. The missile is integrated on SU-30 MKI fighter aircraft as the launch platform, having capability of varying ranges based on launch conditions. It has INS-GPS navigation with Passive Homing Head for the final attack. The RUDRAM hit the radiation target with pin point accuracy. Passive head is used to detect, classify, and engage target over a frequency range. The country has established indigenous capability to develop long range air launched anti-radiation missiles.

RUDRAM Family

Rudram-1 is the first anti-radiation-missile, weight about 600 kg and having a range of around 200 km. Rudram-1 has been tested several times and final testing is done in January 2022 , which is done from the SU 30-MKI and is ready to deployed in the Indian Air Force by the end of year 2022.

Along with Rudram-1 DRDO is developing Rudram-2 which is the upgraded version with 800 kg weight and range of up to 30 km to be used to destroying heavy fortified military installation. DRDO is working on the Rudarm-2A with different warheads and with different roles.

DRDO is also working on Rudram-3, it will be around 1000 kg hypersonic aero-ballistic missile, conveying conventional warheads. The range will be around over 500 km+.Rudram-3 will cruise at Mach 5 and will be used to destroy hard nuclear weapons. These will be deployed on ships for Indian navy and other services of nation.

Conclusion

Anti-radiation missiles are known as radar killing is the future of electronic warfare essential to win the wars like cold war and currently on going Ukraine- Russia. India is developing very rapidly in technology and science field in future we will be super power in missile development by 2035.

Acknowledgment

I wish to extend my sincere gratitude to my research paper guide, **Dr. Vikas Bansal** Associate Professor, Department of Mechanical Engineering for his valuable guidance and encouragement which has been absolutely helpful in successful completion of this research paper. He also co-authored this research paper.
I want to thank the platform of international journal of Novel Research and Development for publishing my work on their website.
I am also grateful to my parents and friends for their timely aid without which i would not have finished my research paper successfully. I extend my thanks to all my well-wishers and all those who have contributed directly and indirectly for the completion of the work.

Reference

1. www.drdo.gov.in
2. International journal of electronics and telecommunication
3. Xicai Si, Jianmin Zhao. Wide-band Anti-radiation missile seeker technology base. Harbin engineering university press.1996.10
4. en.m.wikipedia.org and google

.