



Centre for Air Power Studies (CAPS)

Forum for National Security Studies (FNSS)

DF-26: FRESH INSIGHTS BASED ON NEW HIGH RESOLUTION IMAGERY

Mr Arjun Subramanian P
Associate Fellow, CAPS

One of the remarkable aspects of the 3 September military parade held to mark the 60th anniversary of the victory in World War II was the first ever display of several of China's military hardware which was never officially displayed earlier. Among the weapons displayed, two systems – the DF-21D and DF-26 and the MIRVed DF-5A ballistic missiles- were the centre of attraction. Of these, the DF-26, particularly, kicked off discussion and speculation among military analysts. This article too indulges in some speculations centred on the analysis of the new imagery available on the systems. [The author had earlier done some imagery analysis on the DF-26 based on unofficial low resolution \(grainy\) images available then.](#)¹ The study of the newly available high resolution images of the missile reaffirms and validates some of the analysis and further provides fresh insights on its design and likely application aspects.

The earlier analysis based on the unofficial low resolution imagery of the DF-26 observed that the missile booster might be based on the DF-21. The new closer and better resolution images suggest that the booster as well as the entire missile might most likely be based on the DF-16. The DF-26 canister is visibly sleeker hence the booster diameter appears to be less than that of DF-21. The length of the booster has been increased to cater for longer range and higher payload capacity. There is also a possibility that an improved fuel with higher burn rate is used. The nose section, as observed earlier, is longer which indicates a higher payload carrying capacity and would most certainly carry terminal sensors for higher accuracy. This conclusion on terminal sensors springs from two reasons. Firstly, the missile resembles the DF-16 missile which too is equipped with terminal sensors and is believed to have very high accuracy for conventional precision strikes. Second is the intended role, possible targets, for the missile, which is discussed in the following paragraphs.

DF-26: 3 September Victory Day Parade

Source: <http://i.ytimg.com/vi/6LVczvtbEyl/maxresdefault.jpg>

DF-26 (Payload Section clearly visible)

Source: http://news.xinhuanet.com/english/photo/2015-09/03/134584756_14412842018201n.jpg

There are speculations among China military observers that the missile could also be equipped for an anti-ship role. However, the design of the re-entry section of the missile, as observed, might not be suitable for anti-ship role. The higher payload capacity (weight) in combination with the nose section geometry that appears to be optimised for low drag coefficient would give the re-entry vehicle very high ballistic coefficient which would result in higher re-entry velocity. One other indication towards this is, if the missile design is indeed based on the DF-16 as we speculate, the warhead section would have reaction control motors (attitude control), as in DF-16, which can effect sharper vector change during terminal manoeuvre at high velocity (Aerodynamic controls would not be very efficient at very high velocity). Hence, the missile is designed for higher re-entry velocity which would not be suitable for anti-shipping role. For an anti-ship role, the requirement would be lesser velocity for better manoeuvring and for more time for the terminal sensor to scan for and acquire a moving target. A ballistic missile with a range of 3500 to 4000 km would have a re-entry velocity of around

Mach 16 to 18. For high re-entry velocity optimised missile like DF-26, the Mach value would be even higher, meaning the warhead will have less than 20 seconds from the time of re-entry² to impact. Clearly, the missile would be unsuitable for an anti-ship role. The officially stated ASBM, the DF-21D itself, has not been tested against a moving target as yet.

DF-16



Source: http://www.popsci.com/sites/popsci.com/files/styles/large_1x_/public/df-16_cmr.jpg?itok=NK-1V2zV

The DF-26 appears to be designed specifically for high precision conventional strikes. The most likely target for the DF-26 missile would be Guam going by the range of the missile. Given the nature of the targets in Guam, which are mostly air bases (Guam has two large air bases where, as revealed by satellite imagery, B-52 squadrons are deployed), the DF-26 might be carrying specially designed cluster based bomb-lets to cause maximum damage to bombers spread out on the tarmac. In addition, there could be a specially designed deep penetration warhead for Hardened and Deeply Buried Targets (HDBTs). The DF-16 missile is believed to have such a warhead for HDBTs like command and control centres. Given the longer range of the DF-26, it would have far higher velocity compared to the DF-16s. The higher re-entry velocity would also be effective in penetrating any ballistic missile defences.

Summary of Key Observations

1. Recently available high resolution imagery of DF-26 points to the high likelihood of the missile being based on the DF-16 design with the booster length increased for extended range.
2. There is also a possibility that a better fuel with high burn rate performance is used.
3. The nose geometry and the higher payload capacity indicate that the re-entry vehicle has high ballistic coefficient and hence will have very high re-entry velocity.

4. For terminal control the missile would most likely have reaction control motors rather than aerodynamic control surfaces.
5. The enhanced re-entry velocity makes the missile unsuitable for anti-ship operation.
6. It is highly likely that the missile is specifically designed for high precision conventional strikes.
7. The likely targets, going by the range, would be air bases in Guam and the vehicle might come with specifically designed larger cluster type sub-munitions warhead and bunker busting warheads for HDBT.

(Disclaimer: The views and opinions expressed in this article are those of the author and do not necessarily reflect the position of the Centre for Air Power Studies [CAPS])

Notes

¹ Ambiguity in the East Wind: Dong Feng-25 and Dong Feng-26, http://capsindia.org/files/documents/CAPS_Infocus_AS_3.pdf, 18 March 2014.

² Hundred kilometer altitude is generally considered as the re-entry altitude.