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AMBIGUITY IN THE EAST WIND: DONG FENG-25 AND DONG FENG-26

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In the last two months there were reports in the internet regarding two of China's Inter-mediatory Range Ballistic Missiles (IRBMs). One of these was on the new image of a Chinese IRBM believed to be the DF-25.[i] The other one was on a confirmation from the US intelligence on China's development of the DF-26C IRBM whose range is reportedly 3500 kilometres.[ii] The Chinese maintain a tradition of revealing their new weapon systems by releasing pictures on the internet. But other than that, no further details are given on the systems. The other sources on Chinese ballistic missiles are from countries like the U.S, Taiwan, Japan and rarely some other western sources. The intention of China seems to be to create ambiguity, particularly on their strategic missile force, possibly to conceal their actual capability. As a result, most of the information on their missiles in the public domain is largely speculative, based mostly on the pictures of the systems coming out from China and western commercial satellite imagery. This article too indulges in some imagery interpretation to arrive at some understanding of DF-25 and DF-26.

The DF-25 and the DF-26C are said to be the modified and improved versions (in range and payload) of the DF-21 missile. The development of the DF-25 was believed to be halted in 1996 and the project was re-started in 1998. According to *Janes Strategic Weapon Systems*, the DF-25 is estimated to have a range of 3200 - 4000 km with a payload capacity of 1800 kg and 1200 kg respectively.[iii] However, from the available images of the DF-25 (Image 1, 2, 3, 4 and 5) it can be observed that there is not much change either in the Transporter Erector Launcher (TEL) or the size of the canister compared to the confirmed

images of the DF-21. Hence the range should be more or less similar. One Chinese language website says that the DF-25 is designed to carry a heavier payload of 2000 kg unlike the DF-21's capacity of 600 kg.[iv] This being the case, there is a chance that a better fuel with higher burn rate performance might have been used. One of the latest news reports on the DF-25 missile states that the re-entry velocity has been increased to 7 km/sec[v] which corresponds to the velocity of an ICBM re-entry vehicle. This is reportedly done to defeat the US missile defence systems that are deployed around the region. In the absence of any further information, let us explore this a bit further.

The big question is, can an IRBM (3200 km) be made to attain such high re-entry velocity? The possible ways to achieve a higher re-entry velocity are as follows: Considering the details and pictures available on the missile in the public domain, no major change in the dimension of the canister is observed and hence one possibility is that a different fuel could be used which has a better specific impulse (can be known if there is any change in the launch weight) and the excess throw weight can be dispensed by lofting the trajectory and achieving a steep, near-vertical or vertical re-entry to increase the velocity. Secondly, the ballistic co-efficient may be increased by appropriately shaping the re-entry vehicle. For better thrust extraction from the available fuel, ablative coatings could be used during the boost phase. But even assuming that all these methods have been applied, it is still hard to believe that the velocity can be increased to such an extent as claimed.

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These following pictures are circulating on the internet which is believed to be the DF-25

Image 1: DF-25 (unconfirmed)

Source: *http://news.qq.com/a/20080108/001663_2.htm*, accessed on 11 March 2014.

Image 2: DF-25 (unconfirmed)

Source: *http://news.qq.com/a/20080108/001663_3.htm*, accessed on 12 March 2014.

Image 3: DF-25 (unconfirmed)

Source: http://news.qq.com/a/20080108/001663.htm, accessed on 12 March 2014

Image 4: DF-25 (unconfirmed)

Source: http://news.qq.com/a/20080108/001663_4.htm, accessed on 12 March 2014.

Image 5: DF-25 (unconfirmed)

Source: http://news.qq.com/a/20080108/001663_1.htm, accessed on 12 March 2014.

The DF-26

Image 6: DF-26 (unconfirmed)

Source: http://mil.qianlong.com/37076/2014/01/27/8165@9355421.htm , accessed on 12 March 2014.

Image 7: DF-26 (unconfirmed)

Source: *http://warnewsupdates.blogspot.in/2014/03/chinas-missile-build-up-continues.html*, accessed on 12 March 2014.

Coming to the DF-26C, there is hardly any information on the characteristics or specification even from western sources, except the pictures of the missile claimed to be the DF-26 available on the internet and its estimated range of 3500 km. There are two pictures, the first picture (Image 6), as can be seen, is the rear view of a TEL carrying the missile with the missile portion covered. The second picture (Image 7) does not show the rear portion of the missile, but the payload section can be clearly seen tucked on the crew cabin. Comparing the two pictures, it can be observed that two different TEL with different configurations are used.

In Image 6, the projection observed at the side-rear of the covered part could be the hydraulic piston segment and knowing that almost the entire Chinese canisterised road mobile missiles are cold launched, it could be inferred that most part of the canister projecting beyond the trailer vehicle at the rear is the gas generator segment. Comparing the TEL in Image1, 2, 3, 4 & 5 with Image 6&7, it can be observed that the DF-26 is comparatively longer than the DF-25 and going by the reported range (3500 km), it is

possible that it is designed to carry a heavier payload which is intended to be used for multiple-warheads.

There are widespread speculations among China analysts that the DF-25 and DF-26C could be used as an extended range Anti-Ship Ballistic missile (ASBM). The ASBM is a system that involves a series of vital elements in the kill chain, such as the Surveillance, Reconnaissance and data relay system. The possibility of using the DF-25 and DF-26C missiles as an extended range ASBM depends on the coverage and efficiency of the surveillance and recon systems. The Chinese ocean surveillance satellite system (particularly, their re-visit time), Over the Horizon radar (OTH), surveillance aircrafts, range and capability of the UAV's and other recce systems should be monitored and studied to ascertain this possibility. The much hyped DF-21D ASBM itself has not been tested against a moving target at sea and hence speculating on the possibility of the DF-25 and DF-26 at present seems to be a far cry.

Key Observations and Inferences

- Though the photographs of the missiles are not confirmed by Chinese government sources, we know that they are certainly different variants as significant changes in the external configurations (only for DF-26) and alignment of the missile with the TEL (DF-25) can be noticed when comparing it with confirmed photographs of other missiles in the Second Artillery's arsenal. Hence the possibility of these pictures being the DF-25 and DF-26C are quite high.

- Both DF-25 and DF-26C are believed to be based on the DF-21 missile and hence the booster diameter is expected to be the same with ***increase in the height**** of the missile. (* might not be true for the DF-25 as the size appears to be same as the DF-21)
- The DF-26C is longer than the DF-25 and might have a larger payload capacity, possibly designed to carry multiple warheads.

- Based on Image 6&7, the DF-26 appears to have two TELs with different configurations. Possibly, one could be an earlier variant and the other being the current carrier.
- Both the missiles are two stage, solid fuelled and road mobile and are cold launched.

- If the DF-25s were designed with enhanced re-entry speed, its primary purpose is to defeat the US missile defence systems.

- The DF-26 could possibly be used for other applications as well, like an ASAT kill vehicle booster, for quick micro and nano satellite launch applications.

- These missiles (DF-25 & Df-26) use for ASBM application is a future possibility, but depends on the coverage and efficiency of their surveillance, reconnaissance and data relay systems.

Strategic Significance

The 2013 US National Air and Space Intelligence Centre (NASIC) says that "China has the most active and diverse ballistic missile development programme in the world." It further states that, "It (China) is developing and testing offensive missiles, forming additional missile units, qualitatively upgrading missile systems and developing methods to counter ballistic missile defences. The Chinese ballistic missile force is expanding in both size and types of missiles.[vi] Looking at the number of IRBM they are working on, it appears that it is part of their anti-access and area denial strategy (A2/AD) i.e. to deny access and restrict the freedom of action of the US forces in the waters around China. The US forces depend on a number of land-based theatre bases around China including those in Guam and their aircraft carriers to launch air operations. These high precision Chinese IRBMs are being developed to target these bases in Guam and others that are far off from the Chinese mainland, while the ASBMs are intended to be used against the U.S. aircraft carriers.

Endnotes

[i] "China's DF-25 medium range ballistic missile revealed", http://www.wantchinatimes.com/news-subclass-cnt.aspx?id=20140217000029&cid=1101 , 17 February 2014, accessed on 5 March 2014.
[ii] "China Fields New Intermediate- Range Nuclear Missile", http://freebeacon.com/china-fields-new-intermediate-range-nuclear-missile/ , 3 March 2014, accessed on accessed on 10 March 2014.
[iii] Jane's Strategic Weapons System, Issue Fifty five (United Kingdom: IHS Global limited, 2011), pp 27-28
[iv] See http://news.qq.com/a/20080108/001663.htm, 8 January 2008, accessed on 11 March 2014.
[v] No.1
[vi] "Ballistic & Cruise Missile Threat", National Air and Space Intelligence Centre, 2013. See http://www.fas.org/programs/ssp/nukes/nuclearweapons/NASIC2013_050813.pdf , accessed on 11 March 2014.