



PLAN'S J-15: TECHNOLOGICAL MARVEL OR MILITARY FOLLY?

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When Shenyang Aircraft Corporation developed J-15 little did they envisage that one day they will be facing unfavourable comments from home press. A copy of Russian made Su-33; development of J-15 was facilitated by Su-33 prototype acquired by China from Ukraine in 2001. Avionics of J-15 are more or less similar to that of J-11B (Su-27). On the charges of reverse engineering Su-27 by China Russia canceled a production license to build 200 Su-27s in 2006. At the time of cancellation only 95 aircraft had been built.

The sobriquet "Flopping Fish" given by mainland Chinese-language media, the Sina Military Network (SMN) to J-15 otherwise known as "Flying Shark" is outright departure from the policy of lauding domestic efforts. After all the state controlled China Daily Times has just one day before, sung paeans to the prowess of J-15. On Sept 22, when new aircraft carrier Liaoning just finished a three month voyage and conducted over 100 sorties of various aircraft of which J-15 was reported to have taken off and landed with maximum load and various weapons. SMN, on Sept 23, reported the new J-15 was incapable of flying from Liaoning with heavy weapons. This results in effectively crippling its attack range and firepower. Reasons are enumerated in succeeding paragraphs.

The fighter can take off and land on the carrier with following load:

- (a) Two YJ-83 K anti-ship missiles.
- (b) Two PL-8 air to air missiles.

(c) Four 500 Kilogram bombs.

However the embargo of 12 tons weapon load to get it off from the carrier's ski jump range prohibits it frying heavy munitions such as PL-12 medium range air to air missiles. Adding to the woes is the fact that the fighter can carry only two tons of load, when fully fueled. This amounts to be able to carry only two YJ-83K and two PL-8 missiles," thus the effective reach of the YJ-83K missiles launched from larger PLAN (People's Liberation Army Navy) vessels. The connotation of J-15 getting boxed into less than 120 Kilometers of attack range. This places J-15 at a disadvantage when compared with foreign carrier based fighters. Other disturbing fact is absence an ECM (Electronic Counter Measures) Pod. A large number of J-15s has to be mobilized for even simple missions. This amounts to precious space aboard PLAN's sole aircraft carrier in service simply being wasted.

Notwithstanding above facts, there are enough admirers of the flying machine. According to them J-15 might be a better aircraft than Su-33. They think J-15 is a better aircraft as electronic equipments are lighter. Overall aircraft might also be weighing less due to new composites that China is using on the J-11B that were not available on the original Su-33. Despite improvements, one exclaims why the Chinese bothered with Su-33 in view of the fact that Russia gave up on it. Russians went on to develop MIG-29K instead which has much better power-to-weight ratio and can carry more weapons.

Some diehard fans of J-15 blame Liaoning instead. According to them Liaoning carrier is small and uses a ski jump and is not able to fully realize Su-33/J-15 potential. Taking off from a carrier using ski jump flight deck with take-off weight exceeding 26 tons is very difficult. This is one of the reasons why ski-jump carriers can't be considered to be equivalent to full size carriers with catapults.



A J-15 fighter taking off from Liaoning aircraft carrier's Ski Jump Flight Deck

The **ski jump** is a ramp which is curved upwards at its forward end. For STOVL (short take-off and vertical landing) aircraft eg J-18, the aircraft starts by making a conventional rolling takeoff with the jet exhausts set to provide maximum forward thrust. As the plane nears the end of the ramp (the ski jump portion) the jet exhausts are rotated to provide upward lift as well as forward thrust. Rolling over the ski ramp launches the plane both upwards and forwards. As the plane leaves the ski jump ramp it continues to accelerate horizontally until the wings can provide the needed lift.¹

For conventional aircraft such as the J-15, the aircraft just rolls down the runway in the obvious manner. Again, rolling over the ski ramp launches the plane both upwards and forwards. Such takeoffs allow a larger takeoff weight than an unassisted horizontal launch because the ski jump ramp provides a vertical impetus when most needed, right at takeoff at the slowest takeoff speed; however, ski-jump launches cannot match the payloads made possible by high-speed catapult launches. These takeoffs use less runway length than a takeoff over a flat surface

because the plane takes off at a lower speed, using both the ski jump ramp's vertical impetus and the deflected jet engines to generate lift.²

An **aircraft catapult** is a device used to launch aircraft from ships—in particular aircraft carriers—as a form of assisted take off. It consists of a track built into the flight deck, below which is a large piston or shuttle that is attached through the track to the nose gear of the aircraft, or in some cases a wire rope called a catapult bridle is attached to the aircraft and the catapult shuttle. The ramps at the catapult ends on some aircraft carriers are used to catch the ropes so they can be reused. At launch, a release bar holds the aircraft in place as steam pressure builds up, then breaks (or "releases"; older models used a pin that sheared), freeing the piston to pull the aircraft along the deck at high speed. Within about two to four seconds, aircraft velocity by the action of the catapult plus apparent wind speed (ship's speed plus or minus "natural" wind) is sufficient to allow an aircraft to fly away, even after losing one engine.³

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End Notes

1. Website www.reachoutmichigan.org/funexperiments/.../skijumping07.html accessed on 20 Nov 2013.
2. www.dvice.com/archives/2010/11/up_for_bid_one.php accessed on 20 Nov 2013
3. science.howstuffworks.com/aircraft-carrier3.htm accessed on 20 Nov 2013

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