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# India and the Rafale

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Anatomy of a Bad Deal

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Abhijit Iyer-Mitra is a Research Officer at the Institute of Peace & Conflict Studies. After his B.Com from the University of Madras he pursued a career in the corporate world before turning to academia.

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# India and the Rafale

## Anatomy of a Bad Deal

Abhijit Iyer-Mitra

The Rafale it would seem has won the MMRCA deal in a competition described as “transparent and fair” in keeping with Defence Minister A K Antony’s “squeaky clean” image. Closer scrutiny will however show that far from being transparent and fair, this deal was rigged from the start - conceptually and procedurally to favour a higher cost lower performing plane. During the competition the goal posts were shifted and deadlines ignored specifically to favour one competitor and in many ways the shoddy press coverage of these is testament to the ossified state of India’s defence reportage, and the complete lack of investigative ethos.

This contest started off as a requirement for a light cheap fighter to replace the ageing MiG 21s till the Tejas came on board essentially the same as the Swiss requirement (which settled on the Gripen). Early on it became clear that only three fighters fulfilled that role - the elderly Mirage 2000 with some upgrades, the Gripen which was a full generation ahead, and the vastly improved F-16E fitted with an AESA radar and significant improvements in power and range. At any rate the induction of upgraded MiG 21s by the early 2000s (albeit delayed) meant that the initial requirement became superfluous. Possibly sensing this Dassault withdrew the Mirage 2000 and introduced the Rafale as their sole offering.

It was around this time that what had up to then been the MRCA (multi-role combat aircraft competition) morphed into the MMRCA (Medium multi-role combat aircraft) requirement with the initial cost consideration remaining but the MTOW (maximum take off weight) limit of 20 tons being removed. The addition of the term “medium” here however

hides the malfeasant structuring of this entire contest, where a requirement that had been made redundant was restructured to favour a lower performance fighter but include costs far greater than what was initially envisaged or planned. In essence therefore the winner was decided here – a requirement framed to procure a low performance platform at high performance prices.

### I EXPLORING THE MMRCA

The basis of any modern arms procurement contest is the quality-quantity matrix which is decided on several key performance features - manoeuvrability, life cycle costs, operating costs, power, range, weapons load, ruggedisation, electronic sophistication, survivability in addition to the political advantages and the transfer of absorbable technology. To be sure range and weapons load did and could not enter this equation given that the basic requirements remained those of a light fighter replacement. If manoeuvrability was key then the only plane with thrust vectoring and thus presumably superior manoeuvrability was the MiG-35. If life cycle costs, ruggedisation and operating costs were the key then the Gripen was king.

Should one have taken systems maturity as a sign of electronic superiority then the F-18 had no equal, with the Eurofighter a very close second – lacking only the active radar. In terms of range, power, survivability and transfer of technology the Eurofighter was well ahead of the pack. The only thing the Rafale excelled at was its 9 ton weapons load being nowhere near a

runner up in any of the other categories except possibly ruggedisation due to its navalisation.

Tellingly reports in 2009 indicated that the Rafale was the first plane to be eliminated from the contest. After a whole week of silence the Air Force “confirmed” that this was not the case and there was merely some “missing information” in Dassault’s bid. This basically allowed Dassault to “resubmit” information, begging the question - are deadlines actually deadlines? Should Eurofighter now want, it possibly has a legal precedent to “re-submit” some “missing information”. This story either due to journalistic lethargy or duress was never fully covered or investigated by the media despite ample evidence of direct interference at the head of government level at which point the Rafale’s “reinstatement” was glossed over as a second chance to submit “missing information”

The first round of eliminations then confirmed that procurement costs, operational costs, life cycle costs, were not important given that the F-16 and Gripen were eliminated. Electronic superiority seemed confused since a plane as advanced as the F-18 was rejected but so was the electronically sub-standard MiG-35, the former on the basis of a lack of manoeuvrability, the latter in spite of its supermanoeuvrability. Operational sovereignty was obviously high on the agenda given the mass elimination of American made or American powered planes as well as Russian planes given their abysmal records, the former political, the latter logistical.

The final choice then was for a “jack of all trades” but the two choices were poles apart. While the Eurofighter was almost consistently top of every category – truly a “jack of all trades”, the Rafale was near the bottom of every category – essentially the “dunce of all trades”. In terms of electronic sophistication, optronics, future growth, survivability, and power it stood far behind the pack with its only advantages being its 9 ton weapons load and navalisation.

### Capacity Duplication

Should the Rafale carry its advertised maximum 9 ton weapons load, its range and manoeuvrability drop significantly. Ultimately it

is simple physics that the Sukhoi which is much better powered can do a much better job of fighting its way through air defences and delivering its 8 ton load deep into China, than a woefully underpowered Rafale carrying one ton more, essentially little more than a bomb truck unable to manoeuvre because of its underperforming engines.

Worse still the Rafale is designed to fight at the same height as the Sukhoi, but is expected to do this being underpowered and electronically inferior in most respects given that the Sukhoi can transfer its power to the Israeli electronic warfare systems installed in addition to having one of the biggest radar apertures in the market. Ultimately while the Rafale has been described as a Eurofighter “Minus”, in the Indian context it is in fact a Sukhoi minus having negligible benefits in terms of superior western technology given that such Israeli produced system already arm the Sukhoi.

Most indicative of this are the two competitions where the Rafale lost to the F-15E – the west’s Sukhoi analogue in Singapore and Korea, both of which serve the long range and long leg deep penetration requirement. This then begs the question who exactly is the Rafale procurement directed against? If it is against Pakistan then it is wasteful overkill in economic terms, while being dangerous underkill in electronic terms. The Sukhoi fleet alone will outnumber the Pakistan air force in the near future and in electronic terms the Rafale is simply not a match for the tried and tested F-16 Block 50. If it is against China then the Rafale is a death trap having neither the legs nor power to compete with China’s higher end fighters like the J-10, J-11 and J-20. Its radar aperture is the lowest of any serving fighter and is simply not electronically well equipped enough to compensate for this on the quality end of the matrix. Worst of all its “high end” price means that it fails miserably in the quantity stakes compounding its abject failure in the quality part of the quantity-quality matrix.

Ultimately the Rafale is a plane designed not for a first day of war scenario but rather one where other superior alliance fighters have already

gained uncontested air superiority. While it is definitely an expeditionary fighter, its design is best suited to intervene in Tinpot Little African Dictatorships (TLADs) also known as the *Francafrique*. Any intervention against the vastly better equipped and trained air forces of the Indian Ocean rim would be foolhardy in the extreme, especially if India decides to pursue its “independent foreign policy”. It must be noted that the Saudi’s and Emiratis have in past happily lent military equipment to Pakistan during previous conflicts, and their air forces are manned largely by Pakistani pilots. Should hostilities ensue one must remember that the Saudi’s have both the F-15SE and the Eurofighter while the Emiratis have the F-16E all significantly more mature designs with vastly larger radars and vastly superior detection and weapons ranges.

Ultimately this alone shows up the abject foolishness of deciding this contest based on cost since every single 4+ generation fighter in the region will be superior and the only countries this plane will be useful for intimidating are militarily vastly inferior anyway.

### **Typhoon Vs Rafale**

Three fighters in this competition had essentially the same delta canard layout - the Gripen, Eurofighter Typhoon and Rafale. They were considered equal at least in terms of kinematic ability. Kinematic ability combines both manoeuvrability born of design choices as well as the thrust provided by the engines. These design choices dictated that all things being equal the Gripen and Eurofighter having significantly larger canards would be more manoeuvrable than the Rafale. Additionally the Eurofighter has variable intakes that can regulate the volume of air entering the engines enabling the design manoeuvrability to be more or less similar at both high and low speeds and high and low altitudes, while the Rafale having no such device (or the provision for such device in the future) suffers at both very low altitudes and at higher altitudes thus being forced to fight at altitudes where it is kinematically completely outclassed by Russian and Chinese fighters. This also reflects in the Eurofighter’s service ceiling of variously 64 to 70 thousand feet – a full 10 to 16 thousand feet higher than either Rafale or other serving

and planned Russian or Chinese fighters. Moreover the EJ-200 engine of the Eurofighter has had thrust vectoring incorporated into in recent tests in Spain further extending its cross altitude manoeuvrability into the realm of supermanoeuvrability – traditionally the reserve of high end Russian and US fighters. No such modification is being considered for the Rafale. Height as it can be appreciated is a critical war winner in any form of combat air, land or sea.

The Eurofighter is a full 1 tonne lighter than the Rafale but its engines are significantly more powerful in both dry and wet thrust. This means not only can the Eurofighter carry much more fuel but it can also transfer much more power to on board electronics for electronic warfare and ISTAR missions a mission that in this day and age is considered more important than traditional combat having been vindicated by totally lopsided victory ratios in every war since Vietnam. Also it adds significantly to the Eurofighter’s manoeuvrability advantage producing a much more agile aircraft capable of evading anti-aircraft missiles.

The one current advantage that the Rafale has is its AESA radar, as opposed to the Eurofighter’s radar which is yet to be integrated, and this is a point that Dassault have been stressing. This however is only half the story. The radar aperture being the smallest of any new plane, the array is simply not big enough to outrange/outdetect other AESA’s when they come online. Given that the J-10, J-11 and J-20 have significantly bigger radomes, and China’s first generation of AESA’s are already testing out, Dassault claims of a Rafale advantage are very short term at best or illusory at worst. China’s bigger radars will invariably mated to the SD-10 already the longest range (reportedly) BVRAAM in the market presumably also for sale to Pakistan. It bears note here that the JF-17 that Pakistan is buying in large numbers also has a larger radome than the Rafale, and is actively negotiating with Selex for a western AESA for their JF-17. Given that Selex is as mature as Thales in AESA technology, radar aperture will be critical in any showdown. To be noted here is that the Eurofighter has one of the largest radar apertures on the market east or west. Moreover

the French fighter is mated to the MICA BVRAAM, which the IAF has in a monumentally flawed decision gone in for; given that Pakistan's acquisition of the AMRAAM and the SD-10 outrange this missile by a factor of 50 to 100 %. Yes the Rafale can be mated to the much longer range meteor with the RBE-2 AESA, but the extraordinarily small radar aperture will mean that the Rafale will be hunting clueless in the air and will not be able to fully exploit the meteor's range, being permanently defensive not having the ability to get off the first shot.

Electronic warfare is yet another issue. The Typhoon has significantly greater reserves of onboard electrical generation capacity to provide for jamming and other ISTAR roles which is perhaps the most important element of modern air combat. Given that neither the Eurofighter nor the Rafale are stealth this role assumes significant importance since at some point during hostilities they will have to resort to brute force jamming. The Eurofighter can do this quite admirably while the Rafale's ability to do this is highly suspect. In many ways the Rafale brochure says it all and is a masterpiece of spin. It touts the abilities of a "passive" radar and the passive SPECTRA self protection system. In this particular case it is just another way of saying that the Rafale simply does not have any onboard power to radiate the large quantities of energy required for jamming the latest generation of Russian and Chinese AD systems and radars. Thus the installation of an AESA on the Rafale to begin with is limited by its size and is significantly compounded by inadequate energy transfer. The Eurofighter on the other hand encompasses a much broader spectrum of self defence including passive signature management and active defences including the Defensive Aids Sub System (DASS) in keeping with its admirable power generation.

Exactly how advanced the Eurofighter's electronics are can be gauged from the recent US decision to get BAE to modify the Eurofighter's Helmet Mounted Display system to overcoming teething problems in the F-35. The Eurofighter's cockpit enables the pilot to see through much of the floor and body of the aircraft as if the aircraft never existed – something even the F-35 has

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been having severe problems with. This was acknowledged when EADS was asked to provide the Eurofighter's system, for the F-35's testbed platform recently.

Other issues pertaining to survivability include the increasing prevalence of optical detection and the subsequent need for a reduced heat signature. While the Eurofighter provides high supercruise (the ability to go supersonic without having to engage the heat intensive afterburners) the Rafale neither has nor plans this capability. Moreover the Rafale being chronically underpowered put the IAF's pilots at significant risk against top notch adversarial air forces. Signature Management – another aspect of stealth is another serious issue. While most of the Eurofighter is made up of composites, the Rafale in addition to having a fundamentally un-stealthy curvaceous layout is also overwhelmingly metal, making it much more visible to radars. According to some estimates the Rafale may appear 4 times bigger on the radar compared to the Eurofighter. While both fighters lose their masking abilities if fully loaded up with external munitions, the Eurofighter at least has the ability to carry 4 semi-conformal BVRAAMs i.e. a well armed air defence or interception patrol, which is reasonably invisible.

In many ways while the Rafale is a Sukhoi minus at almost twice its price, the Eurofighter becomes a synergistic ally of the Sukhoi. It has considerable range so as to escort the Sukhois, its electronic package provides significant cover – that is to say western electronic superiority combined with the sheer "grunt" of Russian designs, its missiles outrange all current or

planned eastern missiles, and it has the ability to fight over 50,000 feet, well beyond both the Sukhoi's or Rafale's capabilities. It supplements, complements and extends the Indian Air Force capabilities across range, altitude and electronics providing full spectrum superiority.

Survivability can be viewed as a complex interplay of both invisibility and invincibility. While the Eurofighter true to its "Multi Role" mission has built in redundancies that carefully calibrate this matrix, The Rafale's "Omni-Role" tag only ensures it fails miserably at everything. The Eurofighter is a multi-disciplinary winner, the Rafale a multi-disciplinary loser. The most trenchant criticism of the Rafale's abilities have come from the report of the French National Assembly itself, deeming large sections of its electronics and construction "obsolescent" especially its radar, optical and electronic systems. Similarly the WikiLeaks cables reveal that the King of Bahrain candidly admitted in private that the Rafale was yesterday's technology

## II

### TECHNOLOGY TRANSFER, POLITICAL ADVANTAGES, OPPOSITION RESEARCH

Both the American fighters and the Gripen (which has an American engine) were eliminated since they did not guarantee "operational sovereignty" (meaning that America is seen as an unreliable sanction prone supplier). It is surprising then that the Rafale was chosen. While touted and sold as an all French effort, the WikiLeaks cables from the US embassy in Brasilia (where the Rafale is fighting against the F-18E)

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reveals that it has a very high US content (upto 40%). This must be contrasted with the Eurofighter which is a multinational all European effort. To be considered is that such a multinational approach enables far greater flexibility in the purchase and development of compatible weapons systems as opposed to being held hostage in a single vendor situation, as has been the case with the Mirage-2000, whose upgrade India has to spend more on than buying a brand new and infinitely more capable Su-30.

Similarly this upgrade has foisted India with the MICA in an addition USD 1 Billion deal for the most underperforming, under-ranged BVRAAM in the market. What is curious is both these deals seem to have completely escaped press scrutiny. Similarly the Scorpène has saddled us with the Exocet missile which is again one the most under-ranged anti ship missiles on the market, while the far more capable supersonic Brahmos (ostensibly "indigenous") will not be integrated on these boats.

The important thing here is that the Eurofighter being a pan-European venture also allows India to make far more European governments "beholden" to us noticeably locking Selex out of the Pakistani radar market and thereby choking their last access route to western qualitative superiority. The Rafale deal on the other hand gives every other European company outside of France the green light to go ahead and arm Pakistan with whatever they choose. It is therefore astounding that when a plane like the Rafale fails spectacularly on both operational sovereignty and transfer of technology, not to mention the dubious political advantages; it has been chosen as the winner.

Going in for such big ticket items also mandates careful opposition research – studying the suppliers, their negotiating tactics and pricing tactics from previous victories and defeats. One thing that stands out from this decision is that India continues its spectacular failure to learn from the mistakes of others. Dassault is by all accounts extremely "arrogant" (as described by the UAE) given how substandard its product actually is. It was this exact arrogance that

prompted Kuwait to shelve its Rafale-lust and has lost Dassault its exclusive vendor status with the UAE, and its “captive” Moroccan market. Moreover Dassault is notorious for massively discounting its prices after it loses competitions. As recently as January Dassault after losing the Swiss fighter contract (to the Gripen) it discounted a full 25% of its initial price – over 1 billion euro’s, prompting the Swiss to ask what had changed? The reality is that even if the price difference between the Eurofighter and Rafale was marginal it is still too costly, and the mere illusion of having eliminated the Rafale would have invariable brought about a massive downwards revision of price. That such smart negotiating tactics were not followed speaks volumes of the competence of the negotiating team and selection panel. It is of course equally germane that French “final offers” never really are “final offers” as the Swiss fighter deal discount and Indian Scorpène deal price escalation makes clear.

**III  
THE CURIOUS CASE OF COST**

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Fighter pricing is a notoriously difficult figure to calculate based on open sources given the secrecy (and hence commercial viability) surrounding the subject. A 2006 report by Defense-Aerospace titled “Sticker Shock: Estimating the Real Cost of Modern Fighter” perhaps has the best baseline calculation available from open sources. This innovative report relies on statements to parliament, factors inflation and derives a base price linked to the price of MacDonald’s Big Mac burger, while indexing and adjusting against the prices of luxuries like caviar and gold.

Rafale			Typhoon	
In Million USD	Units		Units	In Million USD
62		A. Unit Cost (2006)		119
55,440		B. Last published programme cost (French Senate 2009, British National Accountability Office 2011)		32,320
	180	C. Confirmed orders at time of publication	160	
308		D. Programme costs per plane amortised over airframes produced at time of publication (B/C)		202
246		E. Non Productive Cost (D-A)		83
	294	F. Total Confirmed Orders as of 2012	232	
151		G. NPC amortised over confirmed orders as of 2012 [(E+C)/F]		58
<b>213</b>		<b>Total Cost Per Airframe (G+A)</b>		<b>176</b>

Sources: See References, All costs and units from categories C (Official Reports) and D (Industry Reports) and all conversions accessing the historical conversions database in category B (Historic Conversion Rates)

The real surprise here is that the Rafale in terms of unit cost (62.1 million dollars in 2006 prices) was the cheapest fighter on the market (cheaper still than the much lighter single engine Gripen even). To put this price in context India finalised another deal with Dassault for the upgrade of 49 Mirage 2000s for a total price of about 3.32 billion dollars averaging 68 million dollars per airframe – i.e the mere cost of upgrading the single engine mirage is more than the production costs of a brand new Rafale.

This speaks loads of the quality of equipment and the non-existent “advancements” that the Rafale supposedly represents. If any further proof was needed as to why the Rafale has failed every single competition and been described by no less than a head of state as “yesterday’s technology” one need look no further.

However in the 2009 French parliamentary report on defence finances the total cost of the Rafale programme spread over the 180 airframes produced so far comes to 39.6 billion Euros (55.44 billion USD at the 2009 annual average conversion rate of 1.4) – a whopping 308 million dollars per plane. This makes the Rafale – going by French official documents the single most expensive plane on earth – just 20 million short of the F-22. Needless to say inflation factored in the 2012 prices will be significantly higher. Simply taking the non procurement costs of the Rafale thus far provides further reason for worry. Subtracting the unit procurement cost of 62

million from the 308 million leaves one with a non productive cost of 246 million a plane – i.e. the plane costs nearly 4 times the price of the actual hardware involved. Multiply this by the 180 airframes produced till 2009 the total non productive costs factor in at 44.280 billion USD. Amortising this over the planned French production run of 294 airframes, this cost stands at 151 million USD per plane. Added to the 2006 unit production cost this works out to 213 million USD per plane.

Contrast this with the Eurofighter. The 2011 British National Audit Office report titled “Management of the Typhoon Project” sets the total cost of the Eurofighter programme over the 160 airframes at 20.2 billion GBP or 32.32 billion USD at 2011 conversion rates. This works out to 202 million dollars per plane largely as a result of the British Ministry of Defence’s (MoD’s) decision to slash the buy by 72 airframes down from the 232 initially planned. Since then however Saudi Arabia has purchased 72 airframes of the British configuration.

The non productive costs of this plane arrived at by subtracting the 2006 base price of the British version – 118.6 million USD per plane from the 202 million total come to 83.4 million. Multiplying this by the 160 planes comes to a total of 13.5 billion dollars. Now amortising this cost over the confirmed procurement of 232 (including British and Saudi) airframes works out 57.51 million per plane, which when added to the 2006 base price makes the per unit cost of the Eurofighter 176.11 million EUR – a full 40 million dollars cheaper than the Rafale, a vastly inferior product – perhaps the most inferior product of the entire MMRCA contest.

#### IV CONCLUSION

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There is some reason that the Rafale has lost every single competition or tender it has taken part in being beaten sometimes by planes like the F-15 or F-16 which are a full generation older. Surprising is the lack of investigation into the Rafale’s preliminary stage elimination, and curious is the silence on Sarkozy’s direct political interference. Brazil almost signed the dotted line

to purchase the Rafale but has put off the entire competition and has asked for a full re-inspection of the selection process going so far as to sack their defence minister Nelson Jobim (for a variety of reasons of which the Rafale procurement featured prominently).

The refocused quality-quantity matrix seems to have skewed this competition towards a high quality fighter with attendant costs but in the end has settled on the lowest of the high quality fighters that can fulfil neither the quantity nor quality requirements of the matrix. In prioritising cost as the final selection criteria the selection seems to have completely ignored the disproportionately higher performance and competence of the Eurofighter not to mention significantly better offsets and transfer of technology for a marginal price difference. In effect while India may spend less overall its “bang for buck” or the competence and advantages gained per Rupee spent are abysmal.

Moreover there are several issues with the entire procurement process that cast a very negative light. First given that cost, technology transfer, kinematic ability and operational sovereignty determined the initial elimination round, these very problems have been negated in the second round by basing it on cost. Second given that the “second round” entailed no further testing of technical requirements it seems that the whole purpose of the second round was merely to place the Rafale against a higher cost option—something that would have been obvious from day one. Since the Rafale could not have hoped to match the single engine offerings on cost—it would seem the entire purpose of the down select was merely to make the Rafale the lowest cost option.

The procedural integrity of this procurement is also highly suspect and patently unfair given that the Rafale was given a second chance to “submit documentation” well after the proposal deadline had passed, throwing the credibility of any future deadlines into doubt when combined with the inordinate delay in the Scorpène programme. At best this can be seen as unethical, unfair and unprofessional goal post shifting but should reports of the Rafale’s early elimination and

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political reinstatement prove true then far greater questions of criminal malfeasance enter the picture (either under duress or monetary incentivisation). The fact that Dassault’s chief negotiator for the 1982 Mirage 2000 deal is on record claiming electronic snooping on classified Indian communications seems to have been ignored completely in this country, and raises serious issues as to if this process was in fact fair and if individuals in this process may have been personally compromised due to French espionage.

On record is a history of bribery in every major defence contract that France has signed in the last decade or so. The Taiwan frigate contract, the Pakistani and Malaysian submarine contracts, and each of these has led to deaths by foul means of Taiwanese, Malaysian and French defence officials and engineers. This is a record that simply cannot be ignored given the twists and turns in this selection process. Also on record are the harsh US, UK and German anti-corruption laws which provision for bribery in foreign countries as well. France’s record on the other hand is of whitewashing even when the lives of its own citizens are taken as has been the case with the DCNS contractors in Karachi.

Malfeasance in this deal can circumstantially be attributed across two categories involving three incidents. The first is political malfeasance that comprised the politically motivated re-inclusion of the Rafale after its elimination following negotiations between President Sarkozy and Prime Minister Singh. This same incident also

plays in the military malfeasance of the framing, evaluation and selection committees of the Air Force in not making such elimination final or voicing opposition to dangerous political interference that breached the institutional integrity of the process. Furthermore, the reframing of the contest as the MMRCA without adequate change to the requirements and gauging the future threat environment for the second incident of malfeasance that must be laid at the air force's gate. Lastly the miserably flawed "bang for buck" equation constitutes the third and final act of either malfeasance or sheer incompetence/ineptitude on part of the air force.

The bigger picture here points to two consistent facets of French manipulation – a borderline genius tactic that renders such corruption invisible to the investigative apparatuses of society – first bribery at the requirement formulation stage to skew the terms of reference, and second chronic underpricing. The first comes into play before the process is set in motion and the second activates at the completion of the process – as a result investigation of the process itself find no tangible evidence of graft since the periods of such graft are excluded by the very scope of such investigation. It is a testament to the substandard quality of the Rafale that it failed even these rigged minimum requirements testing in 2009, while the alarming price escalation of the Scorpène deal points to how post contract price escalations are slowly forced down the consumers throats. The fact that India's military acquisition is managed in a chronically incompetent and maladroit fashion only serves to shield the gradual price escalation that will assuredly ensue.

Signs of this are already on the horizon. When the MMRCA programme commenced it was priced as a 10.6 billion dollar contest. By 2009 newspaper reports were indicating that it was a 12 billion dollar contest. In 2011 the first whispers of 18 billion dollars appeared in the press, while post Rafale victory – within a month – the standard quoted price is 20 billion. At the 213 million dollars per plane rate one should not

be surprised if the costs quoted in the press rise to 27 billion dollars – a much more realistic figure. All this ignores the life cycle costs of the plane which as per NATO wisdom amounts to two to three times the procurement cost – while the myth doing the rounds right now is that the 20 billion dollar figure "includes" lifecycle costs. This assertion is impossible to support given the facts. The true programme cost of the Rafale including lifecycle costs will most likely be in the range of 81 to 108 billion dollars – all for plane inferior to even the baseline Su-30MKI which costs 1/5<sup>th</sup>. The reality is this procurement is going to wreck the modernisation of the Indian Air Force, not because of the costs – but because the costs involved are so disproportionate to the insignificant capabilities the Rafale brings to the table. Ultimately the Rafale and the Air Force selection committee that chose this plane are a clear and present danger to the Indian Union of a far greater magnitude than the PLAAF or PAF ever will be.

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