

## Foreword : June 2009

Dear Sirs/Friend,

1. With a patent portfolio numbering more than ten thousand since 1975, the latest one itself dated May 12, 2009 being for a "Torque steer compensation algorithm" (**Abstract:** A torque steer compensation algorithm utilizing selected vehicle parameters, such as for example engine torque, accelerator pedal position, throttle position, transmission gear, and vehicle speed. Rates of change of the parameters are determined and compared to predetermined thresholds, whereby a torque steer factor is determined. The resulting torque steer factor is subsequently multiplied with a conventional, prior art predicted steering assist signal to arrive at a modified steering assist signal which is output to the coil of the steering column to reduce driver perception of torque steer at the steering wheel), **General Motors Corporation** is a hundred years techno-industrial giant of United States, also a front runner technology path maker and path finder as well. Founded in 1908, GM today employs about 284,000 people around the world. With global headquarters in Detroit, GM manufactures its cars and trucks in 33 countries. In 2006, nearly 9.1 million GM cars and trucks were sold globally under the following brands: Buick, Cadillac, Chevrolet, GMC, GM Daewoo, Holden, HUMMER, Opel, Pontiac, Saab, Saturn and Vauxhall. GM's OnStar subsidiary is the industry leader in vehicle safety, security and information services.

All these notwithstanding, according to Reuters report, "After 100 years in business and 10 months of frenzied but failed restructuring, General Motors Corp is weeks from the bankruptcy filing.... required to complete the Obama administration's bid to reshape a fallen icon of American industry. Facing a government-imposed June 1 deadline to restructure, GM is scrambling to slash some \$27 billion of bond debt, win sweeping cost concessions from the United Auto Workers union and eliminate almost 1,600 US dealers. But with the clock ticking, experts see it as all but certain GM will follow its smaller rival Chrysler into federal bankruptcy court". ***The fall of such a techno-industrial pathfinder has happened, thanks to the economic crisis brought about under the global meltdown. In essence, the massive efforts of the decades long top-class scientific-technological innovations and commercialization face the threat of a massive fiasco under the suicidal financial-political policies of an otherwise mighty country. This straightaway raises the question: Is it not in order that all involved in S&T development also have a stake in the policies followed by their political/policy leaderships?***

2. It appears that the new US administration has woken up to the related issues confronting the nation. In his first address to the National Academy of Sciences US President Obama has categorically said recently (full paper is available in 'publications' elsewhere), "Lincoln refused to accept that our nation's sole purpose was mere survival. He created this academy, founded the land grant colleges, and began the work of the transcontinental railroad, believing that we must add -- and I quote -- "the fuel of interest to the fire of genius in the discovery... of new and useful things... This is America's story.

Even in the hardest times, against the toughest odds, we've never given in to pessimism; we've never surrendered our fates to chance; we have endured; we have worked hard; we sought out new frontiers. Today, of course, we face more complex challenges than we have ever faced before: a medical system that holds the promise of unlocking new cures and treatments -- attached to a health care system that holds the potential for bankruptcy to families and businesses; a system of energy that powers our economy, but simultaneously endangers our planet; threats to our security that seek to exploit the very interconnectedness and openness so essential to our prosperity; and challenges in a global marketplace which links the derivative trader on Wall Street to the homeowner on Main Street, the office worker in America to the factory worker in China -- a marketplace in which we all share in opportunity, but also in crisis. At such a difficult moment, there are those who say we cannot afford to invest in science that support for research is somehow a luxury at moments defined by necessities. I fundamentally disagree. Science is more essential for our prosperity, our security, our health, our environment, and our quality of life than it has ever been before. (Applause.) And if there was ever a day that reminded us of our shared stake in science and research, it's today. We are closely monitoring the emerging cases of swine flu in the United States. And this is obviously a cause for concern and requires a heightened state of alert. But it's not a cause for alarm. The Department of Health and Human Services has declared a public health emergency as a precautionary tool to ensure that we have the resources we need at our disposal to respond quickly and effectively. And I'm getting regular updates on the situation from the responsible agencies. And the Department of Health and Human Services as well as the Centers for Disease Control will be offering regular updates to the American people.... But one thing is clear -- our capacity to deal with a public health challenge of this sort rests heavily on the work of *our* scientific and medical community. And this is one more example of why we can't allow our nation to fall behind. Unfortunately, that's exactly what's happened. Federal funding in the physical sciences as a portion of our gross domestic product has fallen by nearly half over the past quarter century. Time and again we've allowed the research and experimentation tax credit, which helps businesses grow and innovate, to lapse. Our schools continue to trail other developed countries and, in some cases, developing countries. Their peers in Singapore, Japan, England, the Netherlands, Hong Kong, and Korea, among others, outperform our students in math and science. Another assessment shows American 15-year-olds ranked 25th in math and 21st in science when compared to nations around the world. And we have watched as scientific integrity has been undermined and scientific research politicized in an effort to advance predetermined ideological agendas. We know that our country is *better* than this. A half century ago, this nation made a commitment to lead the world in scientific and technological innovation; to invest in education, in research, in engineering; to set a goal of reaching space and engaging every citizen in that historic mission. That was the high water mark of America's investment in research and development. And since then our investments have steadily declined as a share of our national income. As a result, other countries are now beginning to pull ahead in the pursuit of this generation's great discoveries. **I believe it is not in our character, the**

American character, to follow. It's our character to lead. And it is time for us to lead once again. So I'm here today to set this goal: We will devote more than 3 percent of our GDP to research and development. We will not just meet, but we will exceed the level achieved at the height of the space race, through policies that invest in basic and applied research, create new incentives for *private* innovation, promote breakthroughs in energy and medicine, and improve education in math and science. This represents the *largest* commitment to scientific research and innovation in American history”.

3. Such a policy question is relevant *not surprisingly enough* to an ‘advanced developing country’ like India as well. Late Jawaharlal Nehru is often described as the Architect of India’s post-independent science only because through his policies and programs he could create a new breed of relatively young S&T personnel like Homi Bhabha, Vikram Sarabhai, SS Bhatnagar and so on. *And in all those cases, self-reliance was the basic premise on which all policies and programs were to be formulated.* As part of complementing this infrastructure development, Nehru also encouraged a movement to encourage scientific temper among one and all, “to make science as a living force” in the words of Homi Bhabha, the emphasis of both being to create a strong urge to develop India into a modern state propelled through S&T. Minus those policies, and the veteran leaders would simply have not been there with their concrete programs to make these Departments what they are today.

Being primarily a government-supported activity, the S&T sector will certainly be re-oriented to match with the contemporary policy changes, lately dictated more explicitly since the 1990s by the newly adopted post WTO and neo-liberal policies of the successive governments; and this sector has been steadily undergoing a matching process of re-adjustment, however much many talked about of the so-called ‘policy independence’ of S&T. It is very well known how after the first nuclear explosion in 1944 even a titan like Robert Oppenheimer had to pay very heavily at the hands of the governmental authority for not cooperating in the further development of military aspects of the nuclear program. A similar scenario seems to be emerging now in India as well with even increased vigor. Whether as part of the new India-Israel Alliance ISRO had to undertake the launch an alien spy satellite for an *alien use* (its very recent launch of RISAT2 inviting even more bitter comments) or DRDO had to bring in new partnerships again with Israel for missiles development or DAE had to go with a Hyde Act dictated India-US Nuclear Agreement, as a senior retired scientist himself put it in a specific context of the latest RISAT2 launch, “As every one knows DOS is a Govt. Dept and ISRO has to toe the Govt. line necessarily! Otherwise, from where would ISRO get funds? The author of this article is rather naive to suggest that scientists should take a "principled stand" against such moves by the Government (Reference to the “Tango with Israel”, R Ramachandran, Frontline, May 22,2009). You cannot be a Government servant and refuse to obey Government. orders. At best, the Head of a Govt. dept may

resign in protest but then they will find another fellow to head the Department. This is a purely political problem and can be solved only politically. What has happened with the nuclear deal? In what way this is different?"

**4. In essence and as pointed out many a time earlier in these columns, Indian S&T has been going through its own tailspin forced on it through the new policies of the government.** Thus,

(a) Our strategic S&T Departments, the prized jewels of indigenous self-reliance, have suddenly been caught into the **geopolitical whirlpool**. Issues connected with this whirlpool will continue to be raised through these columns driven by the Nehruian doctrine of self-reliance and the well-proven strategies like Homi Bhabha's Growing Science Model. One has to await to realize in what manner will the contemporary policy changes affect the *long term interests* of these Departments (and the nation at large) in moving over from their present level of self-reliant expertise to the higher level, in a way from the levels an 'advanced developing country' to an 'advanced country' in the post-WTO/TRIPS era?

(b) The bases of organized and massive opening up the manufacturing industry to import was professed to be to make it grow as a competitive and self-confident sector from what it was as a high-cost non-competitive activity under the so-called 'license-quota-raj' and to bring in a new urge to achieve it by commit themselves to appropriate technology import and also in massively strengthening *their* own in-house R&D efforts as well so that over the decades their imported technologies will be able to undertake "independent flight with engines of their own" in spite of the TRIPS dictated New Challenges, in the words of late Homi Bhabha. The need for such a changed policy paradigm was accepted because as 'early' as mid-1985, the seriousness of the situation was well known to policy experts in the field. In a masterly analysis of "How They See Us, Technology Suppliers' View" (EPW Special Number November, 1985), the well-known development economist Ashok V. Desai summarized the conclusions as (i) The evidence suggests that despite the complexity of the Indian control system, it does not seem to achieve effective control over technology collaboration. The main problem for Indian authorities must surely be to find ways of streamlining the control system without compromising its objectives – especially those of building local capability. (ii) A qualitative assessment which was frequently put forward was that Indian firms lacked the ability to 'catch up' with the rapid technological changes happening abroad, thanks to lack of incentive for innovation in a protected market and lack of adequate manpower (iii) the conclusion is that there is not much, but too little, transfer of technology (iv) without raising the technological standards of Indian firms, the whole exercise of technology import liberalization would be a waste of time and resources.(v) Indian engineers/workers were good enough to master imported technologies, but not good enough for modifying/improving it. (vi) In essence, *if we judge the success of T/T by the*

*criteria of host's ability to operate autonomously, the T/Ts to India were not conducive to reaching this goal.*

***May be as a fall out of such policy studies, subsequent governments since 1990 have opted for a massive level of technology import liberalization in industrial sector. It is by now well accepted, most unfortunately though, that even after a long gap of nearly three decades of post-liberalization period, Indian manufacturing industry continues to look to outside support for its future, barring a few glorious exceptions like the Indica and Nano model motorcars from the Tata Group and similar products from the two-wheel automobile sector. The much-trumpeted ITC Revolution is totally based on imported systems, the much-denigrated 'screw driver technology' steadily giving way to total import of just packaged products aptly described by some as "plug-in technology". So also the BT revolution bypassing Indian scene including agriculture though it has become the second/third nation in the world using GM Crops, the basis of which is the IP protected Bt gene of Monsanto. Even the much-acclaimed drugs sector seems to be on the negative path under the TRIPS dictated patent regime! And so on .In other words, Industrial R&D in the indigenous sector is in total disarray from a developmental point of view; and this situation can be remedied only if primarily industries themselves come forward to do the needful and for which the nation formulates a new industrial policy, say, on the lines of what MITI did for Japan several decades ago and what Korean government did there.***

***© Over the years, basic research certainly has certainly come of age among a good number of prestigious institutes particularly in the central sector, thanks to a number of initiatives taken under intense lobbying by apex bodies such as Scientific Advisory Committee to the Cabinet, National Knowledge Commission and so on. However one cannot also miss the crucial point that much of this trained manpower has chosen to opt for 'brain-drain' in favor of advanced countries. Alternately, the best among them opt for the new R&D centers established by large MNCs. In other words, bulk of them does not in practice join the national mainstream R&D. In other words, again, the national S&T infrastructure itself needs a totally new re-orientation.***

***4. It is in this context that one looks at the recent excellent article by the well-known molecular biologist and academician D Balasubramanian in The Hindu on, "Science, Obama and the new Indian Government". To quote him, "Obama's declaration is remarkably reminiscent of the commitment to science in the Nehru-Shastri-Indira Gandhi era...Listening to it, I found it had a remarkable resonance with those of our own Late Prime Minister Nehru in the 1950s and 60s, and a remarkable turn- around from the Bush era...we cannot slip up but declare research a national priority and work towards it in a sustained manner. The agenda for the new Indian government is thus laid out". Accepting that a good***

amount of ground work has been done through the erstwhile SCA and the National Knowledge Commission, the author continues, "Areas such as education, science and technology, health and medicine, and agriculture need accomplished professionals who can single-mindedly move the country to be a lead player in the world, by encouraging seeking out and unleashing the talents in our people. And that would mean appointing people with *proven* expertise in the field. **And the scientific and education community will be behind the new government, if it does so, and willingly work with the ministers in reaching new horizons**".

**And so on and on!**

5. It must nevertheless be admitted that in spite of many a confusing policy signals in the governance horizon, our premier S&T agencies are once again in the news, and for very good reasons too. Thus, to quote Indian Express, "India on May 18/19 successfully test-fired its nuclear-capable 'Agni-II' missile with a strike range of up to 3,000 kms from a launch pad off Orissa's coast. The test of the indigenously built Intermediate Range Ballistic Missile was carried out from a mobile launcher at about 1006 hrs from launch pad-4 of Integrated Test Range at Wheelers Island near Dhamra, about 80 kms from here, defence sources said. It was a user trial conducted by the army and scientists from Defence Research and Development Organisation (DRDO) were present to provide the necessary logistical support, the sources said. The trial of the sophisticated missile was successful and scientists would conduct a detailed analysis. The missile after three successful trials by DRDO is ready for production. "We have completely developed systems for such variant of missiles," a senior defence scientist said. A special missile group has been raised in the army to handle such weapon. The state-owned Bharat Dynamics Ltd is the nodal agency for production of Agni-I and Agni-II missiles. The indigenously built surface-to-surface Agni-I missile has a strike range of 1500 km, while Agni-II missile has capability of hitting targets at ranges between 2500 to 3000 kms with a 1000 kg pay-load".

**Let us hope and trust that the priced jewels, DRDO, DAE and ISRO, continue to be *pathfinders* of the nation's self-reliance in strategic S&T.**

5. **It is in this context again that one reads another excellent article by a senior retired bureaucrat NS Sisodia now heading the Institute of Defence Studies and Analysis, IDSA, on "The case to strengthen Indian think tanks"**. His main points are the following:

*(a) Think tanks help bridge the gap between the world of ideas and action and are equipped to generate policy-oriented research and inform policy decisions. As the Manmohan Singh government begins its second innings, India faces a host of security and foreign policy challenges. Does India have the intellectual tools to meet these challenges? This issue was debated at a recent workshop, not in 'rising' India, but in*

*Singapore's Lee Kuan Yew School of Public Policy. It sought to answer the question: 'Can Indian think tanks and research institutions cope with the rising demand for foreign and security policy research?' The answer was an emphatic 'No.'*

(b) It is difficult to claim that think tanks change policy, as political leaders receive inputs from many sources. But good policy research offers independent analysis, critical assessments, alternative perspectives, new insights and sometimes-innovative ideas. Effective think tanks can help in more informed decision-making, agenda setting, sensitizing the public, briefing lawmakers and testing new ideas. They are a potential source of expert personnel for the government, the legislatures and the media. *And they can challenge the conventional wisdom of the establishment.*

(c) Think tanks exert greater influence in countries like the United States where key decision-makers move in and out of the government along with the President. Washington alone has some 350 think tanks. They are often termed "governments-in-waiting." President Barack Obama chose John Podesta, who headed the Centre for American Progress, as his transition chief. George Bush often relied on the 'neo-cons' of the American Enterprise Institute. Bill Clinton tapped policy advice from the Brookings Institution. American scholar James McGann estimates that there are nearly 5,500 think tanks in the world. North America alone has 1,872 (34.25 per cent), Western Europe 1,208 (22.1 per cent) and Asia 653 (11.95 per cent). Compared to India, China has done much better in developing the domain of International Studies (IS).

(d) For a democratic country facing major challenges, informed debate and consensus on vital national interests are crucial. Think tanks can play an important role in this context by highlighting key issues, proposing alternatives and sensitizing relevant constituencies and politicians.

(e) The policy establishment also complains of a supply constraint, not so much in terms of quantity of research output as its quality. Even government-supported think tanks work mostly on their own, setting their own research agenda. The researchers have hardly any access to key officials. In the absence of data from Ministries such as External Affairs and Defence, and archaic information policies, the research findings of think tanks are rarely "grounded in reality." There is no system to declassify even half-a-century-old archives.

(f) To give an impetus to policy research in IS, the government will need to take some initiatives. First, reforms in universities as recommended by the National Knowledge Commission need to be implemented. Second, the government should ensure systematically a closer interface between think tanks and Ministries such as External Affairs, Defence and Home. Such interaction will improve the policy focus of their work and enhance quality through feedback. Third, think tank analysts should be deputed to Indian missions in key countries for a year or two to hone their language

skills and deepen their domain knowledge. In order to ensure results in the near-term, greater attention needs to be given to develop the existing government-sponsored think tanks into world-class institutions. This will require strong government support for institution building and reforms, capacity building of researchers through language training, field trips and appropriate personnel policies.

**6. Obviously S&T is another sector, which solicits very badly an appropriate forum of think tanks, the absence of which became too explicit when the nation started debating the pros and cons of the much-discussed Indo-American Nuclear Deal to start with and the newly emerging India-Israel Defense alliance involving ISRO and DRDO, leave alone the TRIPS dictated challenges for Indian R&D 'of possible industrial use' in all fields including agriculture, and so on. Amazingly enough, the fully autonomous and prestigious Science Academies and most of the nation's acclaimed professional societies prefer to close their eyes on such crucial S&T policy issues instead of debating within consciously through related studies and coming out public their consolidated views! In other words, there is a strong case "to strengthen Indian think tanks" in S&T as well.**

7. Let us recapitulate briefly how late Jawaharlal Nehru himself had looked at the issue several decades ago. Soon after independence when India chose to pursue an independent foreign policy, he felt the need of having an independent minded Think Tank composed of experts in international politics and area studies outside the Ministry of External Affairs and which could provide a second opinion on the government's course of action, having realized the dangers of depending solely on the advice of the officials in the Ministry. He accordingly asked HN Kunzru and A Appadurai, President and Secretary-General respectively of International Council of World Affairs (ICFA) to start a School of International Studies for the said purpose. Thus was born the Indian School of International Studies (ISIS) in 1955, the same eventually becoming a deemed university itself, in turn into the Jawaharlal Nehru University School of International Studies in 1971. For many years it was obligatory for all IFS probationers to spend up to four months in the School to get them equipped to enter into the Foreign Service and beyond. During the last half century, the School has certainly created a large reservoir of experts in the field with knowledge of the politics, psyche and cultural ethos of almost all major countries in the world and with which India has significant diplomatic links. How to convert this abundant talent pool into dedicated Think Tanks, this seems to be yet a 'dream' as clear from the article by Sisodia, himself formerly a Secretary of Defense. In the case of S&T, one may say, NISTADS, a Constituent S&T Policy Research Institute under CSIR, is the only one dedicated to be working in this direction, not forgetting that there are sub-optimal groups working in some universities as well. On the whole, our professional expertise in this field is perhaps even much weaker!

8. Incidentally, the constitution has provided some elegant mechanisms to see that the government is *statutorily seen* to elicit expert views from outside the establishment structure that is through the Select Committees of parliament as and when at least major legislations are involved. Even though it is still debatable whether the Executive can sign

unilaterally any treaty without having statutory approval of parliament, only the latter has powers to approve any legislation to implement a treaty. And it is the customary practice of all parliamentary bodies that major pieces of legislation are always referred to the dedicated Select Committees for its study and recommendation. The Constitution enshrines upon all citizens the sovereign duty to utilize this forum and depose their views by seeking for an opportunity and which the Committee cannot refuse. The Committee can alternately seek the views of outside experts as well on any issue as a matter of course. Thus, if the ruling combines had agreed to refer the India-American Nuclear Agreement to such a Committee, all outside experts including those who had retired from service could have adopted such a procedure. Further, the Committee could have officially sought the views of also those in service like Chairman, AEC himself. Unfortunately enough, it was not done by the parliament with its wisdom and in the process the non-official debates had to be confined to public statements through the press only! Even retired Chairmen of Atomic Energy Commission had no *statutory* forum or alternative to depose their views! The same malady happened when the ruling group decided not to refer to such a Committee the bill for the final amendment of the Patents Act, knowing to one and all that the bill would be affecting even the very concerns of public health! More of this will be discussed in coming issues. Unfortunately, thus, much remains to be done to make these forums truly effective and in turn in making our democratic governance more meaningful and effective. "Miles to go before we sleep", as the famous poet said, before India emerges as a true parliamentary democracy ably equipped to handle complicated/multi pronged techno-political- policy issues in tandem with its the short and long term interests.

**Last but not the least, the new government has chosen to allot the S&T portfolio to a Minister of State of Independent charge, but who is loaded with responsibilities also of PMO plus a few more crucial ones added to the list. Hopefully, this is not a change for S&T to be seen in a *disadvantageous* position, that too when major challenges are seen in the horizon under the TRIPS dictated policy regime! Very challenging thoughts of the week, coinciding also with the sad demise of the Architect of Indian Science, late Jawaharlal Nehru nearly four-and-half decades ago!**

**Yours sincerely,  
A D Damodaran.**