

(1201)

to convince Chairman. Rajan Saab
I need ~~to~~ your help to push
it through. Try to convince all
about its importance"

Finally thanks to perseverance
of Y S Das, CHSS was introduced
in ISRO in ISAC ~~to begin to~~ and

Bangalore units to begin with, with
a provision to introduce in other

places where ISRO units are. SAC
ek joined later. It is a great

privilege ~~eng~~ enjoyed by ISRO
employees today. Very few

would even remember that it was
due to Y S Das ~~than~~ AS, DOS it

came to be!

(1202)

When it came in 1978 (or 79?), none in ISRO would have understood its great significance for well being of ISRO employees at all levels.

Another item YS Das pushed through was to get quarters for ISRO employees ~~but~~ by initially purchasing the already built up quarters by LIC (Teeran ~~Bhima~~ Bima Nagar). That led to the concept of having quarters for ISRO employees which was a very low priority due to budgetary constraints. Later this concern for living in a good house was extended by TNS in his second avatar in ISRO/DOS during 1980's by making ISRO employees to form a cooperative society

(1203)

and our ~~throw~~ plots. About
it later in 1980-1990 period part.

This was also the period in
which ~~the~~ the contracts for tender
specifications for ~~getting INSAT~~ procuring
INSAT globally ~~was~~ ^{were} done. In
principle the ^{Satellite} manufacturers from
Europe were also eligible (even ^{from} USSR
but there were no mechanism in USSR
to quote for such global tenders. They
started realising this lacuna and was
~~was~~ their giving IRS satellite launch
for such a training.) But at
that time only USA companies were
capable of doing such advanced satellite
- which involved some ^(then) cutting edge
technology like unfurlable antenna
and R&D to adapt three satellite
services into one satellite (Telecom, TV & Met)

(1204)

I played a major role in evolving the specifications. PPK, JPS were there. Sanjeev Deshmukh was there to assist PPK.

Before coming to that a major uncertainty was around SD's continuation, (at least for him).

On one side there was a failing health of ~~D~~ BP - he had a stroke - recovered. Then went on till the first launch of SLV-3. And a new VSSC ~~&~~ Director was selected.

As for SD it was more hypothetical (but could not rule out the possibility)

SD would be completing ~~19~~ 58 years ~~on~~ ⁱⁿ ²⁰ Sept 1978. In other words he had to retire on ~~end~~ Sept 1978 if the usual rule of ~~5~~ age of

(1205)

Superannuation or retirement for govt servants applies. ISRO alone ~~had~~ had 60 years of retirement age derived from its earlier existence but continued for all ~~except~~ scientific and technical staff (including technicians). This was also a legacy from DAE.

But SD did not belong to ISRO. In fact his substantive appointment was ~~from~~ in IISc which had 62 years as retirement (adjusted to the ~~later part~~ academic year. i.e. June 1983). But Director IISc was not a govt servant. ~~Of~~ He just received ~~a~~ Re. 1 p.m from DOS. Such arrangement can legally continue. But Govt had

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to take a view whether they would like a serving Secretary of a Dept beyond 58 years.

SD did not want to take a chance and ~~late~~ create a default situation ~~at~~ when he reached 58 years. He placed a nice note to PM (Morarji Desai) well in advance of a few months pointing out his approaching age of 58 years and the prevailing age of retirement of Secretary to GOI. Quick came a reply from ~~Mora~~ PM to asking him to convince :-
" ~~Please to~~ and then it said " Groom a successor " I had seen this note. There was no time period laid.

(1207)

Also the task of grooming (and therefore selecting) a successor was left to SD. It was ~~not~~ not the Appointments Committee of Cabinet ~~but~~ not a selection committee.

That would have been relief for SD. Some of the "slowness" I ~~was~~ ~~is~~ was lamenting in my notes might have been due to this nagging question in SD. In ~~March~~ April ~~1977~~ 1977

— transition from IG to Morarji.

(SD was a selection by IG)

~~That~~ Also the rule of one-man-one-post he was enforcing.

SD was most elegantly treated by Morarji Desai so that he could continue. Now a 58 years barrier during early 1978. ~~So~~ That

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also crosses.

The INSAT deal, with its global tender and lot of money involved, would have been a big worry for SD. That was probably the reason ~~why~~ why he was referring even relatively smaller items to the Space Commission. ~~YSDas~~ as AS would not have prevented as he was a cautious person.

TNS would have viewed it differently. He believed that Dept should take decision and not take ~~over~~ many ~~things~~ things ~~to~~ to Member for Finance (MF); he believed that the special status given to DOS & Secy DOS should not be whittled down.

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I am saying this from his strong observations during ~~the~~ his second tenure ~~1980-85~~ in the 1980's period. More on it later.

This, of course, was helping JPS whose importance ~~was~~ would go up as ~~we~~ for every Space Commission meeting he would make drafts and give to AS & Secretary D/S. ♀

But this process took away too much of SD travelling to Delhi ~~and~~ ISRO which was revolving around Chairman ISRO that too now ^{with} more Directors and Project Directors and too many activities, could not ~~access~~

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have the benefit of its conflict resolution mechanism of referring to its Chairman ISRO. Though formal systems had been put in place by SD they were always strained. The SAC - ISAC

conflicts escalates even small items to Chairman ISRO ~~but~~

ignoring the Project Mgmt Comd.

The intra - Centre conflicts in VSSC especially against the Liquid Engine programme delayed

~~at~~ ^{serious} ~~the~~ start of Vikas project.

Moreover SLV-3 project which was going towards its peak

needed attention. SD's knowledge

of aeronautics and therefore inhibits on rocketry was very

(1211)

much needed ~~for~~ for resolution of some issues.

On the whole though ISRO ^{activities} programmes were increasing, SD's availability was decreasing though he was accessible. In fact the irony was that he was accessible and therefore all ~~the~~ sorts of things were sent to him. He was not like his predecessor VAS who made monthly visits to SSTC and ~~the~~ resolved ~~the~~ conflicts based on quick meetings & presentations. But ISRO was too small. Now stakes were high; ~~the~~ number of projects / personnel was very high. Also SD was not capable

(1212)

of instant decisions based on presentations and quick (often noisy) discussions. So ISRO

did show signs of slowing down — ^{time-} in _h rate of action.

P. Sudansan ^R who had excellent

wit used to openly say that

this was due to 'INSATification'

of ISRO.

But SD's worries would have been as to how to keep the system "clean" with such heavy ~~his~~ investments were involved and when global companies were ~~not~~ involved. In the Indian context it was a "honey pot"!

Only towards the end of

(1213)

of his tenure (either in 1983 or 1984) when we ~~travels~~ returning from Delhi to Bangalore (we were seated together) amongst some wide ranging discussions, he (only once) told me

"I wish I had not agreed to the \$ procurement of a foreign made INSAT; we should have wanted and done it by ourselves".

It was a quick statement. I did not ask him why as he started saying something on another topic.

But I feel even now (much more now @ 2017) that it was a good decision to have gone

(1214)

for a \$ purchase of foreign INSAT.
No doubt Indian engineers especially
at ISAC learnt a lot of satellite
technology — which would not
have with the gradual evolution
of firm APPLE. It would have
been a mistake & if we had
not started on the proto-INSAT
(later named as INSAT-II
series). APPLE experience plus
~~IRS~~ ^{foreign} INSAT + IRS gave
momentum to INSAT-II indigenization.
The failure of INSAT-1A also
was in a way good because
foreign lobby, if any, in Delhi
(P.T.O)

(1215)
~~(1125)~~

would have been temperes.

But most importantly
~~the~~ foreign procures INSAT-1
 (the second working INSAT-1B)
 gave a ~~not~~ real operational
 demonstration of benefits of
 space technology — which ISRO
 was talking about since 1960's.
 If ~~the~~ ISRO had wanted
 for ~~in~~ India made INSAT-
 then my best guess would be
 it would not have been
 before 1990. ~~And~~ Given the
 failures of ASLV-3 which
 took place, there would have
 been ~~not~~ criticism about
 ISRO's delivery capability ^{to}

~~(1216)~~ (1216)

deliver useful applications.

No doubt there was an operational IRS but its uses were not that visible; would have looked elitist's or hand waving.

The INSAT-1 of the ~~1983~~ 1983 plus and its visible services for telecom and TV & Met made ISRO's talks about ~~space~~ benefits from Space, real — ~~can be~~ could be felt by ordinary persons, politicians, bureaucrats etc.

I ~~was~~ was aware of it not just because I was involved in definition of INSAT in ISRO-MIT

~~(1127)~~ (1217)

Studies etc. While self-reliance ~~exactly~~ was my real goal, but I was practical. I was an engineer in actual profession. I knew the difficulties in those complex engineering needs for satellites. Had seen it ATS-F project and discussed with ~~the~~ best of the experts in the world. I was deeply aware of the gaps we had between Aryabhata, SEO-1, APPLE etc and how world was in late 1970's and ~~to~~ what new things were coming. I was not a "self-reliance" extremist! I was seeing how CSIR, Electronics etc were becoming masters of non-delivery by just talking self-reliance and ending up only doing some

~~(1128)~~ (1218)

crude import substitution.

Again unlike HAL, BEL
etc we were not subservient to the
foreign supplier - the "Principals"
in their parlance. We were masters
of the specification we ~~wrote~~ wrote;
it was not outsourced to a consultant! &

~~Contr~~ So in ISRO's long history
INSAT-1 (foreign procured one)
was a good and necessary inclusion.
The fact I played ~~an~~ some critical
roles ~~was~~ may makes me happy
even now - though the detailed
processes in those days ~~had~~ had
lots of messy happening (not all
essential; many really avoidable!)

(~~4199~~)(1219)

in ISRO HQ / DOS Sect. They put lots of pressure on SD as well and ISRO's programme which was crucial in the overall strategy of the Self-reliance - in - Space mission. They get reflected in my notes.

* * *

Now I will summarise my involvement for INSAT-1 Project. In addition to the work done at ISRO-MIT studies, and later some specific notes sent to VAS, Chitnis and YP, after coming to HQ, I was kept in the loop of INSAT-1 specifications, technical work and ~~of~~ ^{preparations}

(~~1130~~) (1220)

for global ~~tech~~ tender (for procurement of foreign made satellite and launch). JPS & PPK would not have liked it. PPK wanted to monopolise it himself; and JPS wanted the "overall" control on behalf of "Secretary DOS". It was a strange combination of two prima donnas. Had TNS been there during those formative days of 1977 plus ~~it~~ it would have been explosive. YSD's was there bearing much of the shock from ~~these~~ JPS & PPK. SD kept me ~~for~~ nearly fully in the loop by ~~marking~~ marking important papers or telling me

(43+)(1221)

to do certain things. YP was there only nominally; he was going by what PPK said. EVC was totally sidelined. SD involved URR because he wanted the technology aspects of satellite to be seen; not just depend on PPK. (JPS was weak in that.)

My role was also for satellite, ~~and~~ QA & testing, and various aspects of ^{specification &} contract management as I had handled them for NASA at ATS-F project

As regards the papers to Space Commission for approval I was not involved; ~~not~~ nor did I want it. JPS wanted ^{the} ~~a~~ site

(132) (1222)

monopoly over it. But PPK would
allow it and YS Das could not be
avoid it as he was the Secretary to
the Space Commission.

In specification writing

~~At~~

In specification writing I
PPK did ~~a~~ much of the work
through his Project office-in-charge-
making. My role was more in
reviewing. But for Q & A & testing
I wrote most of it.

~~Then~~ when the rest
The specifications was
written in a neutral way without

(1134) (1223)

~~with~~ any specific favour
for three-axis stabilised system
or spin stabilised system. ~~The~~ The
later was preferred by Hughes
as they had considerable experience
in it. But because of the ~~re~~
integration of the meteorological
payload, three axis stabilisation
was necessary. ~~Though~~ ATS-6

was a three-axis stabilised satellite.
So was the satellite design in ISRO-MIT
studies though it did not have
the met payload. That idea
came later.

There was a constant fight
between JPS & PPK about which mode

(435) (224)

to go and between the capability
of Hughes, FACC and GE. Sometimes
JPS ~~is~~ would make a number
of loose talks that PPK ~~is~~ wants
this company, etc. He would
keep on changing his statements
too. It was more to "bulldoze"
Others like PPK and URR so that
they could be made to be worried
about arguing for a case and
to seed some doubts in a
generalist like YSDas and also
to show off generally to ISRO HR
people as to how much he
was upholding integrity against

(136) (1225)

biassed persons involved in ^{INSAT} ~~RLRAG~~.
He would sometimes throw in
words that IB ~~is~~ was watching
these. As a balance to JPS
PPK was equally a prima donna
and adamant. But he never
spoke about others in such
accusatory terms. He would mostly
try to put his arguments
and would say how ~~of~~ the
opposing view point was wrong.
He would also ~~to~~ access SD
~~often~~ and tell his problems;
he would do it alone without
~~his~~ the HQ man # for INSAT" - JPS.
That ~~would~~ would also irritate
JPS.

(#37) (1226)

Finally the point came for evaluating the quotes. I do not remember how many quotes had come. They were to be separately available as Technical & Financial bids. The Technical bids were to be opened first and to see whether they qualify technically — that is, meet the main ^(bids) specifications of the quotation called for. It was normally to be discussed in the project management ~~board~~ board. But as usual it was partially dysfunctional as there was more of acrimonious debate ~~rather~~ rather ~~than~~ than finding ~~harmon~~ solutions with harmony. Mostly

(1138) (1227)

it used to be a direct verbal fight between PPK & JPS. In the initial days when YP was Chairman INSAT-1 Board he was totally ~~not~~ clueless to resolve such acrimony. YS Das was perplexed to see two senior

officers were fighting. ~~and as the~~

~~was~~ YP would appeal for calm.

No way. In the early days

SD has put me as a Special

Invitee to The Board, by his

written order constituting the

INSAT-1 Mgmt Board. Both JPS

& PPK would not have liked it.

I did not like it either. I

had told SD. He declined to delete my name. where Be there for some time

(H39)(1228)

and let us see!" was his answer.
Therefore ~~The~~ ~~SD~~ had to attend.
Earlier SD had ~~asked me to~~
~~that~~ told me about PPK's
request that I be ~~the~~ ~~Dy. Manager~~
Dy Project Director for INSAT-1
I had flatly refused it to SD.
Told him "Please don't put
me in such a conflicting situation.
I won't come to you, though you
won't be accessible, because I
believe in managerial discipline." ~~It~~
I know PPK's style right from
my NASA days... Impossible for
me to function under him; he
does not want any ideas from
his colleagues. Also he wants
them to be just "under" him!"
~~The~~ Skill^{SD} wanted me in
the early crucial years till

(1140) (1229)

the contract was finalised & signed. So was my role in

~~SSP~~ INSAT-~~SSPO~~ Project Mgmt Bd;
which was serviced by PPK at SSPO office.
(SSPO → Space Segment Project Office)

In addition to the hot air hateful talks, ~~it~~ there was competition in smoking between PPK & SPS. In between YP would light his pipe (It was a scholarly style in those days!). ~~It~~ The room was literally smoke filled.

Since I had ~~no~~ my beard & long hair, I was the worst affected. When I come home Goma used to ask: "Any big meeting; you completely

(1141) (1220)

smell of smoke!" YSDas had
often asked me ^{so} why these two
persons behave like this for
every meeting.

I used to read all
papers coming to Board and
had my notes. ~~In~~ In between

to relieve the pain of shouting between
these two gentlemen he used
to ask my opinion. I ~~would~~ would

give it ~~short~~ in ^a short spell. Would

not ~~try~~ take any ~~side~~ sides

with any one of them, though at
times one person or another would

be right in what they said!

In the early days YP

(142) (1231)

used to ask me to prepare a ~~com~~ conciliatory draft, because often times, the fight in the Board used to start from the confirmation of minutes and go on for hours!

YP would say "Rajan! Thoda UN style ka draft banaav yaar, to bring together these ~~different views~~ differing views!" I had done so for a few times for me.

Later, I think after a year or so, I requested SD

(1143) (1232)

to relieve me of that pain!

Coming now to the
~~the~~ ~~ambitions~~, it was naturally
impossible for the Board to
come to unified conclusion. I
think by this time URR was
appointed as Chairman of Board
~~thought~~ because YP also desired
to get involved in UN COUPOUS
as he had an eye on becoming
~~the~~ the first UNISPACE Chairman
— a senior UN position (Under
Secretary General position, with lot of
prestige in those days).

SD had a few
rounds with me about the best

(~~1144~~) (1233)

way ~~for~~ of assumption which was
the ~~best~~ better option for ~~the~~
~~proc~~ procurement of INSAT-1,
in other ~~was~~ words whom to
choose. It can't be by financial
bid alone, unless there was
a "consensus" or "full acceptance"
that one or both (I think
~~it was~~ bids were only
from Ford Aerospace & Hughes).
~~are~~ found were found technically
acceptable. Were there substantially
significant ^{technical} advantage of one
bid over another? It was
on this point the differing
views of JPP & PPK ~~were~~ were sharp.

(1145) (1234)

They were not ready to sit down and assess the merits and de-merits or risks "objectively", that is without ~~of~~ personal biases. SD could not leave it to either one of them ~~not~~ not just to URR. Then bickerings would still continue. Both JPS & PPK were capable (or were doing) of writing strong notes against any conclusion.

Another serious problem in Indra, then, was ~~if~~ there was no independent ~~academic~~ ~~fe~~ and knowledgeable academic

(1146) (1235)

who could give a considered
view. (In spite of efforts
started by SD right from 1976
to develop such persons in
academia through involving
them in ISRO Design reviews,
even now, ^{@2017} it ~~is not~~ is so!
It is difficult to find ~~some~~
even one person with some
knowledge of practical engineering
issues in satellite making!)

Even within ISRO there
were ~~hardly~~ only a few
persons who could understand the
whole system of INSAT-1, its critical
specifications, ^{essential} design parameters etc.
Let alone assess critically.

(1147) (1236)

After a few discussions with me (may be perhaps with others) SD came to be a conclusion of having a structured questionnaire to be answered by a few knowledgeable persons. I was given the responsibility of ~~evolving~~ making such a structured questionnaire. It should capture all essential parameters critical for assessment. It should be as detailed as possible so that many parameters ^{were} ~~are~~ captured. The errors of subjective judgments in answering those questions by the knowledgeable persons ~~was~~ were averaged out. I was in a peculiar situation because I could

(1148) (1237)

not consult others. If there were many persons who could answer those ~~at~~ important questions then 2 or 3 of us could have intensely debated and arrived at a questionnaire ~~which~~ capturing all essential items. But it could not be done. ~~Who~~ because those who create questionnaires have to be barred from answering it! (Earlier we did a success criteria for the launching of first satellite Aryabhata, but that was not to be answered then; it would be filled - as it was - after launch.) But here the situation was very serious and important. It was a question of deciding on a tender.

(~~1149~~) (238)

So there was huge responsibility on me. I could not say SD approved it because his own detailed subject knowledge on this matter was not very high, though he can appreciate the logic of parameters chosen. It also shows the immense confidence SD had on my neutrality — not having any biases.

So the questionnaire was done and administered in IISc. The four persons were: PPK, JPS, URR & RMV. They were closeted in four separate rooms without any phones. They were asked not to come out or consult any papers or others.

(1150) (1239)

They were also given a time limit by which they should complete the questionnaires.

SD & me were the investigators. The venue was IISc Director's office, the tower building.

The session was over. I calculated the results and gave to SD.

Both the parties who had grades were well above the threshold level that was set up as acceptable limit of qualification. Their levels were such that even with variations in weightages for the parameters in the questionnaire. Now all the

(1151) (1240)

Controversies (esp. between JPS & PPK)
as to who was better — actually which
should be rejected on technical grounds
according to them — was over! SD
would have been very much relieved.
Now it was only financial bid
and resultant actions!

I had covered this ~~to~~ as
a total not going by year by year
to get an overall appreciation of
my role and also how SD had to
handle INSAT-1 so delicately.

I am now ~~to~~ not covering
the negotiation part after the

★ FACC was selected on the
★ basis of financial bid finally.

This experience with INSAT-1

(152) (1241)

very much useful in selecting
the Liquid Engine Test Facility
data - some where in ^{early} 1980^s. Fortunately
for that we could have many more
people from VSSC & SITAAR. I
played a crucial role in that questionnaire
as well

* * *

~~Now~~ Now I would revert to the
normal mode of narration, going
roughly in year wise sequence
based on the papers returned by SD
plus other items I had listed as
notes for myself in writing this.

* * *

(1153) (1242)

Before ~~that~~ doing so one more interesting episode from INSAT-1 ~~negot~~ tender finalisation and contract assignment.

In the final contract formulation there were detailed negotiation of clause by clause. I had to cover the portion covering testing, quality assurance etc. There would always be a tendency to "assume" everything in sentences. In Indian contracts GOI persons have a habit of writing down every thing so that later during audit they can escape, passing on the "blame" to others who came up later during the implementation of the contract. In the normal course most of the conditions and specifications of requirements remain on paper.

(1154) (1243)

American Space Industries having worked with NASA did not go by such boiler plate approach. Also things like testing & quality assurance imply many technical specifications, rejection rates etc. So one had to provide for funds for each such specification — because uncertainties ~~are~~ are involved.

So I used to explain to YSDas specially ^{on specific issues} that the probability of some problem occurring is so low. But if we specify that they have to prove by testing, a large number of tests would be involved. Also they may try to "gold plate" the manufacturing processes; the cost naturally would pass on to the customer who asked for it!

(155)(244)

Best thing is not to specify such tests and leave to standard practices of USA - NASA & ~~the~~ their DoD (Defense). In case some problem happens, we can solve them with much lower cost...

These are calculated risks, informed decisions because we know the state-of-art practices. Just placing some ~~specif~~ speculative "worries" with "ifs" and "buts", we may not get any advantage at all in performance but pile up lots of unnecessary tests and also the contract ~~padding~~ padding up for uncertain "rejections"... Overall cost would go up. A ^{1920's} standard industry practice dump (1980's) was

(4156) (1245)

in those days would lead to about 30% in testing & ~~QA~~ quality assurance. If we put speculative specifications it may go up more! Contractor won't mind as his costs are paid for! YSDas understood.

Like this then ~~we~~ were ^{needing} ~~of~~ sound technical judgement so that costs can be minimised and other performance parameters

optimised. We did that. But we also take care that we don't put unnecessary burdens of cost on contractor; if done too much they will cut corners. At the end of the finalisation when contract had been awarded

~~to~~ ~~the~~ ACC, Mr. Berry Vice President
FACC, came to see me in my office to say good bye. He first thanked the office staff for helping out in some

(1157)(1246)

urgent typing or xeroxing. Those were days when the ubiquitous PC's ~~files~~ ^{tablets} were not with people. We had to make corrections manually. Then he came to me and grasped my hand:

"Mr. Rajan, I admire the way you people had handled the contract professionally. You have cut us right upto the bones but have spared the bone & marrow carefully..."

I came to say good-bye.
& If ever you leave ISRO, pl. let us know; the doors of FACC are open to you!"

I just said "Thanks!"

I had an opportunity to be in a US Space Industry from end 1973 itself when I left NASA.

(1158) (1247)

Now another offer in about six, seven years after I left USA! I took it as a compliment for my knowledge and capabilities. Otherwise I never thought of leaving India. Though there were many day-to-day pin pricks, some very sharp, in working in ISRO HQ, I felt that I was in a great Mission. I was also confident that if I had to ISRO sometime (which possibility I did not rule out especially as SD's ~~term is~~ term would end sooner or later) my idea was to get into another Indian organisation, where I could make some avant garde contributions.

* Now back to the regular writing as a continuity of my earlier notes; we were in 1977.

*

*

(1159) (1248)

Now we can enter into 1978, using my notes as a clue.

The INSAT load on ~~ISRO~~

~~the~~ Chairman ISRO had been pointed out in my earlier notes to ~~Chair~~ SD during 1977. In addition inter-centre coordination had become a major issue. The Directors of the Centres were meant ~~to~~ not only to guide and oversee their Centres, ~~and~~ resolve issues therein, but also handle inter-centre issues (as most of the ISRO work ~~was~~ involved more than one Centre. For example SLV-3 Project involved VSSE, ^{and ISTRAC.} ISAC, and SHAR / APPLE involved ~~ISAC, SAC, VSSE and SHAR/ISTRAC.~~ It was so for many other not so

(1160) (1249)

"visible" projects. Director SAC was very undisciplined and YP allows things to drift and not resolve issues.

URR & YP did not talk to each other to solve such issues. Shorting of letters to each other and raise issues to Chairman, ISRO became the pattern. There were also such skirmishes from SAAR, VSSE, SLV-3 project though BP took care; but he ~~had~~ was also not keeping that well.

As far the budgeting process was concerned, it started really in the Zero-Based-Budget mode and with a sharp Project, Programme & Tech. Dev. Projects mode. The earlier free lancing was greatly removed. This was SD's deliberate policy so that ISRO can concentrate

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on projects and succeed. The internal / intercentre jealousies within the Centres put the project activities as "enemies" of the R & D in the Groups of R & D Divisions. This is the conflict of

the matrix management systems.

As we had explained earlier, the persons ISRO had no other outlets.

So the internal pressures were high.

SAC-ISAC conflict was endemic.

SAC thought it should own application satellites and be the

boss: ISAC was only a supplier to the "orders" placed by SAC! Just as FACC delivers for DOS! But

SAC did not have any ~~ex~~ experiential capability to manage a satellite project. At least ISAC has due to ~~the~~ Aryabhata & later SEO etc.

(1162) (1251)

Net result was that in 1977-78 (financial year) there was going to be a huge surrender of budgeted money. We from ISRO HQ had convinced Planning Commission to allot ~~more~~ funds — a difficult process because there was all round economy measures and Govt wanted to cut budgets of Depts (it was so most of the years later too!) To "fight for" & get budget allocated was not easy. Similarly based on our work, SD had to convince Space Commission, as the Finance Member would like to cut budgets under ~~with~~ normal assistance from Finance Ministry.

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So surrender of budgetted money is taken as a weakness of the budgeting process of the Dept and it becomes very difficult to get funds for next years.

Already two financial years had passed 1975-76, 1976-77 with ISRO becoming fully govt using govt procedures, which ~~to~~ are no doubt a slower process than what

ISRO did before (using PRL rules)

But with govt (public) money there was no option. For 1977-78 surrender it was difficult to blame the "switchover" to govt procedures.

~~But ISRO~~ It was much more due to ISRO's mode of

~~1164~~ (1253)

working which caused the problem. The problems within the Centre for projects and inter-centre problems for projects or facilities (programmes) were not getting resolved quickly.

Naturally that affected the purchase of materials, equipment etc. Rudhir a paper to Chairman ISRO was like a stay order by courts; the opposing Centre was using it as a tool to stop the Prime Centre or Prime Project to act through through the well written structures of ^{Project} Management Boards, Proj. Management Council etc. We had explained in some detail how INSAT-1 Mgmt Bd functions or not functions!

(165) (1254)

Though other project boards were many times better, still escalating issues to Chairman ISRO had become a pattern. Hence when Chairman ISRO was not available to resolve the "problems" things were stagnant. No decision; ~~no~~ no purchases; fund surrender.

I was worried about it: one for ISRO itself; another for ourselves ISRO HQ / DOS team's face with ~~Planning~~ Planning Commission.

SD was not firm with his Director. ^{Since} ~~If~~ he did not, he was overloaded; and he could not decide on everything because he was not an easy

(1166) (255)

of 'Yes', 'No' decision maker. He had to understand issues! But in real managerial terms these ~~were~~ were issues which should not even come to Directors by the Centre let alone SD, Chairman ISRO. ISRO's well structured Management Systems remained more on paper and were becoming dysfunctional, with even simple issues escalating to Chairman

Hence my m/n to Chairman ISRO (Handwritten 3 pages) dated 3/3/78 titled "Some action items and issues of concern"

↓ ~~They continue~~ (Copy attached as continuity of 1167, 1168, + 1169) (1256, 1257, 1258)

Attache
here
3/3/78
handwritten
note.

#(1256)

3/3/78

To: Prof. S. Dhawan

TO BE OPENED

From: YSR

BY CHAIRMAN

Sub: Some action items and issues of concern

1) The heavy surrender of money this year allround, amidst other things, indicates that our scientists/managers find it difficult to do expenditure if the bounds of programmes are well fixed and "free lancing" is minimised. Another one important reason I see, is that Chairman ISRO was not available this year to review and "needle people to keep them on toes" due to his INSAT preoccupations.

2) Is this a good system? Definitely not. But people cannot be changed overnight. INSAT Board works ~~like~~ⁱⁿ free lance SAC "discussion mode"; papers are very poorly done. If any body, including acting Chairman, tries to make a point the reaction of the Project Director is "I don't agree".... As regards ISRO centres, coordination amongst technical persons and Centre Directors move in a snail's pace... When everything becomes supercritical things are rushed to Chairman and "HQ is delaying matters!" is the standard complaint.

3) Decentralisation of powers and decision making as it exists now is quite adequate and Chairman may ^{consider} writing a formal memo to

[P.T.O]

The Directors emphasizing that it is their responsibility to ensure intra-Centre and inter-Centre coordination at god-speed and keep Chairman, ISRO informed. To Shri P.P. Kale ~~may~~ Chairman may consider telling ~~or~~ or giving a memo that he should not be rushing to Secretary without trying adequate coordination at his level with INSAT Board members and others concerned.

I feel if these are ^{not} enforced by Chairman by firm instructions and actual practice, all the action points (even petty) will fall on Chairman's lap, with the executives not doing their actions till Chairman tells them.

4) Already Chairman is overloaded. He needs physical and mental rest. This is needed not only from health viewpoint but also to think about and discuss with Secretaries etc on major issues of policy and advanced planning needed for IRS, SLV-V, & Proto-INSAT. Chairman can get rest only if other important executives do their homework meticulously and not pass the buck to Chairman. Also without some exemplary punishments where (in cases where senior persons behave irresponsibly) such a discipline is difficult to enforce.

5) Such enforcement by Chairman at Senior levels could lead to percolation of some system downward.

6) On H&R organisation Chairman had told to me to write a draft especially on Secretary, ISRO's role and responsibilities. I will give a draft by month end.

Rajan
4/3/78

P.S: I have sent some drafts on SHAR. Chairman may consider issuing them soon.

Rajc

3/3/78
3 page note
copy before use

(1170) (1259)

SD ~~in~~ in his own

show, ~~with~~ (analytical, ~~experiential~~
~~experimental~~) processes was

moving ~~to~~ towards issuing some
formal orders for ISRO HQ (partly

- to relieve him of some of the
loads from Centres). He had
asked me a few times earlier
to give him a draft; whom all
he had asked, I do not know.

(Nor ~~do I~~ did I like to snoop
on that by talking to Chairman's office)

~~It was not~~ A draft was not

an easy ~~to~~ issue. We were all

roughly same age groups in

ISRO HQ; though there were

some differences in grades, it

(1171) (1260)

was not as it was between
~~new Centre~~ Directors of new Centres
and the persons there. VSSC
was an exception ^(as it had many senior persons) but they had
a ~~toe~~ towering BP above them.

• For example URR or Pant were
Centre Directors like BP with same
status, there were many in
VSSC (like VRG, SCG, AEM, Easwari
etc) who were even senior to URR
in overall ISRO hierarchy. But
they had no voice in ISRO Council,
which was relatively powerful
those days.

I was much junior to
all Directors of Centres though
Science Secy ISRO is a member
(I as Asst SS services it). When

~~to #6 (1172) (1261)~~

I am made Secretary, ISRO
I will be full member
of ISRO Council.

Finally I made
a draft as I had indicated
in my 3/3/78 note and
sent to SD ~~through~~ ^{through}

a transmittal date 20/3/78

title
It follows as text -

(Copy attached)

Attach
20/3/78
NOTE
13 page
text

1262	1263	1264	1265	1266
1173	1174	1175	1176	1177
1178	1179	1180	1181	1270
1267	1268	1269	1184	1185
1182	1183	1184	1185	1186
1271	1272	1273	1274	

↓ (see next page)
~~There is~~ for copy

(1262)

INDIAN SPACE RESEARCH ORGANISATION

HEADQUARTERS

MEMORANDUM

For: Prof. S. Dhawan

File / Ref:

From: Y. S. Rajan

Date: 20/3/78

Subject: Drafts on Secretary, ISRO.

1) I am placing below a memo (Flag A) and draft orders concerning the role of Secretary, ISRO (Flag B). Chairman had asked me to do this soon.

2) For sake of comparison I am also placing the only order on Scientific Secretary, ISRO which existed before (Flag C). The situation now is far more complex than it was before.

Regards

Reg.
20/3/78

(1263)

TO BE OPENED BY CHAIRMAN ONLY

To: Chairman, ISRO

20 MARCH 1978

From: YS Rajan

Sub:- Role of Secretary, ISRO.

Chairman had told me recently to hurry up the write-up on the role and responsibilities of Secretary, ISRO concerning the role irrespective of the present Chairman and myself who is Asst. Scientific Secretary, ISRO. I should point out that the job of such definition is not that simple because the work of the Secretary, ISRO will involve complex relations to the tasks of the DOS Joint Secretaries and the Programme Offices to be set up within ISRO HQ.

As I had explained to the Chairman many times before (orally and in writing) it is necessary to set up a few Programme Offices within HQ without which the roles of others cannot be defined; either Secretary, ISRO will be overloaded or will not get anything to do.

PROGRAM OFFICES

Hence I would suggest that the following four Program Offices be immediately set up: the rationale is to build around the four persons who have shown some interest and capability in management. But about the launch vehicles area, I have some concern lest the Programme Office becomes an impediment to growth (some of the impatience, the aiming at super-perfection, desire to "order - around" etc of the person concerned need some tempering).

...2/-

(1264)

(i) PROGRAMME OFFICE FOR COMMUNICATIONS:

The tasks are to plan and monitor the activities of ISRO in satellite communication & navigation applications. The major projects that will come under this are STEP, APPLE Utilisation etc. This office should liaise with the Programme Office of INSAT to plan for indigenisation of INSAT communication elements and for experimentation/development that may arise out of INSAT.

(ii) PROGRAMME OFFICE FOR MANAGEMENT INFORMATION, DATA PROCESSING, ^{RANGES} & ISTRAC.

The tasks of this Office are to plan and monitor the ISRO/DOS budget, manpower & operational expenditure. The office shall coordinate suitably with DOS for these matters. All matters connected with computers and data processing (be it for Projects or for ISRO general R&D) will be dealt with by this Programme Office in consultation with other Programme Offices concerned. Also this Office will have a sub-office on Ranges & ISTRAC headed by ----- to plan & monitor ISRO Ranges & ISTRAC activities including the status of development of software for satellite and launch missions. The head of the sub-office will report to the Head of the Programme Office.

(iii) PROGRAMME OFFICE FOR ISRO TECHNOLOGY TRANSFER & UTILISATION AND LAUNCHERS.

All activities related to the TT&U will be done by this Office. On contractual aspects the Joint Secretary of DOS dealing with Finance should concur with the proposals for taking action. ISRO activities on launchers, & rockets shall be dealt with by this Office for planning and monitoring. There will be a sub-office under this office dealing with the development, fabrication and production of chemicals, materials & propellants.

(1265)

(iv) PROGRAMME OFFICE FOR SATELLITE TECHNOLOGY,
REMOTE SENSING & SCIENCES:

This Office will deal with activities related to planning and monitoring of ISRO activities in Satellite Technology, Remote Sensing which includes meteorology and geodesy, & Sciences. The ongoing projects like SEO, RS-1 and APPLE will be dealt with by this Office. For indigenisation of INSAT, this office will assist the Programme Office for Communications/ Programme Directorate INSAT in terms of inputs on Satellite technology & meteorology. This Programme Office will have a sub-office dealing with the Space Sciences which will include activities of PRL and INCOSPAR. The Head of the Programme Office may name a person each to monitor the ongoing satellite projects with the approval of Chairman, ISRO.

(v) FREQUENCY PLANNING & COORDINATION UNIT:

This Unit will take care of the formal aspects of the DOS/ISRO frequency coordination, CCIR etc related matter etc. This Unit will coordinate with the Programme Offices also besides interacting with the Centres.

The following persons will be under each office:

Communication Office :: JPS , NK, Kibe, _____

Management Information)
Data Processing,) :: KSP, PNJ, Nene, Jain
Ranges & ISTRAC Office)

Technology Transfer &)
Utilisation and) :: VS, PS, Safaya
Launchers Office)

(1266)

Satellite Technology,) :: YSR, Chandrasekhar,
Remote sensing & Sciences') VR Rao, A.Krishna Prasad,
Office.) S.Krishna Murthy, _____
) SC Chakravarty.

With the above items defined, there could be a general statement by Chairman as under:-

"The programme offices are essentially tools for effective coordination of various activities of ISRO. For most of the routine matters the persons in the Programme Offices may correspond or deal with the Project Director, Head of Divisions or engineers concerned. In case there are issues of policies or major problem areas, the Head of the Programme ^{office} shall study these in detail and refer the issues to the respective Centre Director/Head of Unit. When problems are not resolved at this stage, the matter may be brought to Chairman, ISRO, preferably by the Director/Head of Unit & Head of Programme Office jointly highlighting the problems needing resolution. Since there will necessarily be some overlaps between the activities of the Programme Offices and the Joint Secretaries of DOS, effective coordination between the Programme Offices and DOS shall be done in terms of information, consultation, and/or prior concurrence as necessary. The division of tasks between the two Joint Secretaries of DOS will be as per the Order _____ dated _____. The role of the Joint Secretaries' will range from formal control, decisions, advice, concurrence or formalised communication channel depending on the established ISRO/DOS practices in this regard. The main role of DOS is to ensure that Government directives are followed."

(1267)

ROLE OF SECRETARY, ISRO:

Having set forth the tasks of the Programme Offices, one can enlist the role and responsibilities of Secretary, ISRO. Some responsibilities such as overall supervision of RESPOND, University matters, INCOSPAR, publicity & publication activities and ISRO HQ administration including ITLU Offices & ISRO Liaison Cells in Bombay and Delhi are straightforward. Another item would be to be the Member-Secretary of ISRO Council; as regards the execution of activities like norms, pay-scales etc. it is better that JS(W) handles it in consultation with Secretary, ISRO, since the Under Secretaries also have to be drawn into some of these processes.

As regards international relations presently these are dealt with by Shri Warrior, J.P.Singh, Prabhu and myself. UN matters by Shri Warrior and myself. How far these need to be done by Secretary, ISRO, may be decided by Chairman. May be the present method is okay with Secretary, ISRO getting an overview along with JS(W) of DOS.

Overall scientific, technical and managerial overview and coordination is something, I feel, Chairman ISRO is looking forward to the Secretary, ISRO doing as an important ^{task}. It is in this area some conflicts with the Programme Offices might arise. If there are no provisions for Secretary, ISRO to generally get into (albeit minimally) the activities of the Programme Offices, such an overview especially for planning will not be available to the Secretary, ISRO. Presently Chairman has made Asst. Scientific Secretary, ISRO, member of the SLV-Board and most importantly marks important papers to Rajan/_____ & . Formalising

(1268)

of Programme Offices might cut this channel of "overview" - other than the overview being with Chairman, ISRO.

Hence some "powers" such as the following may be considered for Secretary, ISRO:-

(i) Secretary, ISRO will be responsible for bringing up important issues to the ISRO Council. All such issues from the Programme Offices, DOS & Centres/Units shall be referred to him.

(ii) Secretary, ISRO may also from time to time seek information from the Programme Offices/Centres/Units on issues considered important for ISRO programmes. He may refer these matters to Centre Directors/ISRO Council/Chairman ISRO for immediate actions, if any; such a process shall preferably be done in consultation with the concerned Centre Director/Head of Programme Office

ADMINISTRATIVE POWERS WITHIN ISRO HQ:

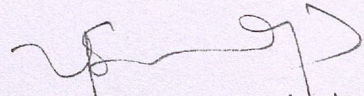
Since INSAT Programme Office has a separate Budget, the Programme Director has been given powers somewhat similar to Asst. Scientific Secretary, ISRO. But if all Programme Offices are given powers similar to these, then ISRO HQ budget has to be virtually split to four units for operation. Normally this is not done. I would therefore suggest that the five persons - Heads of Programme Offices & Head of Frequency Coordination Unit - be given the powers of the Controlling Officer for travel of themselves & their staff, expenditure on contingencies upto Rs 5000/- per annum, and payment to consultants upto 5 per annum & a ceiling of Rs 5000/-. Otherwise all the administrative powers may be vested with Secretary, ISRO. There is also a need to revise (upward) the administrative powers delegated to

(1269)

-7-

Asst. Scientific Secretary to avoid lot of routine items routed to Chairman, ISRO (who has the powers of the Head of Department). I have worked out a draft which I will coordinate with Shri Das at some time instructed by Chairman and place later.

With these explanatory notes, Chairman may please consider the draft placed regarding Secretary, ISRO's role, & responsibilities in the Appendix.


YS Rajan 20/2/78

(1270)

Appendix
DRAFT

STANDING ORDER SC/CH/-----/78

Sub:- Role, responsibilities and authority
of Secretary, ISRO

ISRO programmes have now grown in size and complexity needing ever greater coordination between various tasks and efficient management systems. Besides effective monitoring about the progress of various aspects of ISRO Projects and programmes especially the ones involving the inter-Centre/Unit and the inter-agencies, there is also an urgent need to plan effectively for the future programmes. In order to do such an effective coordination at the ISRO level, there is a need to organise the ISRO/DOS Headquarters into a few Programme Offices to serve the ISRO Council & Chairman, ISRO more effectively. This will be done through a subsequent Order which will supercede all organisational arrangements done at ISRO/DOS Headquarters excepting this Order, the ones relating to the INSAT Programme Office and the ones relating to the duties of JS(D) and JS(W) except to the extent modified herein or in the Orders relating to the Programme Offices.

(1271)

-2-

This Order is to define the role, responsibilities and authorities of the Secretary, ISRO. Hereby the designation of Member-Secretary, ISRO Council is abolished and Shri S.K.Warrior is named as Member (Admn.), ISRO Council and Shri Y.S.Das will continue as Member (Finance) ISRO Council. The designation of Scientific Secretary, ISRO and Asst. Scientific Secretary, ISRO are abolished. _____ will be the Secretary, ISRO until further orders and _____ will be a Member and the Secretary of the ISRO Council.

Secretary, ISRO will assist Chairman, ISRO and ISRO Council in all matters relating to the ISRO programmes. To discharge this function of obtaining an overview of the present status and planning for the future programmes, he shall seek the assistance of the Programme Offices & DOS, to the extent possible. He is hereby given the authority to seek and obtain necessary information on all matters connecting to ISRO programme from the ISRO Centre Directors, Director PRL and the HQ Programme Offices.

Secretary, ISRO could bring any issues for decision to the ISRO Council/Chairman ISRO which he should normally do in coordination with DOS, HQ Programme Offices and/or Directors.

...3/-

All matters to be brought up to the ISRO Council shall be routed through Secretary, ISRO who will take necessary actions on these as per the instructions of Chairman, ISRO.

Secretary ISRO will be in overall charge of the P&PRO Unit of ISRO HQ. He will consult Joint Secretary, DOS on matters concerning Governmental interfaces etc.

Secretary ISRO will be in overall charge of RESPOND Programme and is authorised to approve any proposals/projects below Rs 5 lakhs (in total), above which he will seek the approval of Chairman, ISRO.

Secretary, ISRO will be in-charge of ISRO HQ administration including ITLU's in Paris and Washington, the Liaison Offices in Bombay and Delhi. Order on his financial and administrative powers will issue separately. Till such time he will exercise the financial powers delegated to the Asst. Scientific Secretary, ISRO vide Order No.HQ:ADMN:1.2 dated 21st April 1976 and Office Memorandum No.HQ:ADMN:1.2 dated 21st April 1976. On important matters of expenditure concerning ISRO HQ, he will consult the Joint Secretary, DOS dealing with finance. In cases

(1273)

of unresolvable differences the matter shall be referred to Chairman, ISRO.

The allocation of Sounding Rockets for the experimenters will be the responsibility of Secretary, ISRO. Secretary, ISRO is also authorised hereby to have formal correspondence on matters concerning International relations of ISRO/PRL which he shall do as per the Government instructions on this regard and also consulting the concerned Joint Secretary of DOS; to the extent possible he should consult the Programme Offices and the Centre Directors. Secretary, ISRO is also authorised to formally correspond on behalf of ISRO with any Indian agencies/Institutions which he shall do in accordance with the broad guidelines and instructions of Chairman ISRO/ISRO Council; if contractual obligations are involved he shall consult the concerned Joint Secretary, DOS.

Secretary, ISRO will also assist ^{Chairman &} Secretary, Space Commission on matters referred to him.

(S. Dhawan)
Chairman, ISRO
&
Secretary, DOS

(1274)

INDIAN SPACE RESEARCH ORGANISATION
ISRO

Ref: AS/I-22

August 1, 1973

MEMORANDUM

From August 1, 1973, Prof.P.D.Bhavsar, Scientific Coordinator, ISRO, will assume additional responsibility as Scientific Secretary, ISRO, until further orders. He will report to Chairman, ISRO and will be in-charge of ISRO's Scientific Headquarters which will provide scientific and technical staff support to Chairman, ISRO as well as to the ISRO Council and the Space Commission. Besides looking after the work of the ISRO Scientific Headquarters, Prof. Bhavsar will be responsible for the ISRO Offices in Bombay and Delhi.

Within the budgetary provisions for the ISRO Headquarters and following guidelines laid down by Chairman, ISRO, the Scientific secretary, ISRO is authorised to:

- i) approve payments for ISRO Scientific Headquarters expenditures within the budgetary limits.
- ii) authorise travel within India of the staff of ISRO Scientific Headquarters.
- iii) appoint personnel in the Scientific Headquarters upto and in the grade of Rs 700-1250 p.m.

The Scientific Secretary, ISRO, may delegate his powers to other members of the Headquarters staff to the extent necessary.

sd/-

(S. Dhawan)
Chairman

26/3/78
note copy before
the

#(1186)(1275)

Immediately after such strong critical ISRO orientation as expressed in my notes, I had been worrying about the fate of S&T & Space programme in India. Under Indira Gandhi's rule such issues did not arise. ~~It was more at~~ Both from her side and from opposition, it was more about politics, corruption etc. Then the dynastic orientation with Sanjay Gandhi and the Emergency placed the issues in completely different planes.

With her being ~~def~~ defeated the new Govt was an ensemble of various opposition of groups, each having their agenda. Most of them were oriented strongly towards themselves. ~~The~~ Many were strongly opinionated on economics,

(1187)(1276)

industrial policy ~~et~~ etc. Naturally there ~~were~~ were some against "Big Science", wanting rural technologies (almost asking for self-sufficiency at local levels); some with terms of appropriate technologies. The "intellectuals of science" claiming leftist orientation wanted the science in India to move away from industries to rural areas. The ~~idea~~ emerging scientist-politicians and their cliques also talked in multiple voices to get attention for themselves. Naturally there will be a number of CSIR bashers; there were also persons from within CSIR attacking "big science", meaning Atomic Energy, Space etc. There was

(1188) (1277)

utter confusion. Unfortunately
~~but~~ unlike in Iq's rule, this
Cacophony was printed all
over.

Fortunately, as I had
pointed out earlier, Morarji Desai
as PM gave a solid support
~~to~~ to ISRO when files went to
him. He did not speak anything
for or against it thus keeping
Space ^{ISRO} away from controversies. But
there was no coherent policy
for electronics which was crucial
for ISRO - space quality components.
To be fair, the new Govt conts
should not be blamed as

(1189) (1278)

DOE under Pym MAR Memo from
1971 was ~~not~~ busy suffocating
growth of electronics — in the
a name of self-reliance and
possible cooperation was killer.
Even Indian industries ~~were~~ were
suffocated. HAL, BEL etc
were law unto themselves
just keeping ^{their respective} ~~their~~ ministries
happy.

For me the goal was
to catch up fast with USSR
and USA. I had seen both
of them — USA much better; I
had seen many space industries.
I had been to their ship floor
~~as through~~ NASA GSFC period.
dump

~~(190)~~ (1279)

After ~~of coming~~ ~~returning~~
returning to India for
ISSP & HR work, I had visits
a number of European countries. Their
space programmes, though limited
to one - or - two items were very
advanced. They were advancing their
technologies on par with USA in
the fields they ^{have} selected. ~~Examined~~

For example Netherlands
with its famous industry Phillips
built an Astronomical Satellite
in the Infrared region — very sophisticated
one in 100 kg class with composite
materials etc. The crucial thing was
its Infrared sensor. ~~That~~ That satellite

(1280)

Space based
opened up the windows of Infrared
Astronomy at the world level

There were many examples from Europe,
which I had seen.

USA, of course, was rapidly
moving in almost all applications
of Space; going ahead in Space
Sciences causing revolution in our
understanding of our planetary systems,
sun, and galaxies; in military
applications of Space, though publications
were limited, USA was marching ahead.

USSR was also going ahead, about
which we could learn from the
USA's ~~Congressional~~ Congressional
~~hear~~ hearings and records.

(1281)

While in India we were moving forward, ~~the~~ we were dependent fully on a foreign launch vehicle even for a low weight class satellite. For ~~of~~ APPLE, an European developmental flight; for INSAT-1 satellite & launch on USA, though we were fully paying for it. Our own SLV-3 was miniscule. ~~Even~~ Our SES-1 & SES-2 it was somewhat like an experiment done by USA / USSR in late 1960's. APPLE was also very limited.

As for electronics we were totally dependent upon purchases from USA for the space quality components; and also for measuring equipment. Even for ground support

(1282)

System we were dependant. For propellant we had indigenous development. But one was not sure about future projects of ISRO — will they be approved? ~~It~~ Was ISRO gearing up. Its pace of defining its future satellites & SLV-variants was slow, (as may be seen from my ~~an~~ earlier notes)

It ~~is in~~ was in this context I sent a note dated 3/4/78 (typewrite) I had compared the Indian progress (or rate of growth) vis-a-vis the global context including Chinese. Note is attached in next pages.

→ 1283, 1284, 1285.

→

Note
Typew
3/4/78
3pc

(1283)

TO BE SEEN BY CHAIRMAN ONLY

To: Prof. S. Dhawan
Chairman, ISRO

3/4/78

From: YS Rajan

Subj:- Future of ISRO - i.e. future of indigenous
Space Technology in India.

1.0 Though I have shown some traces of my sadness in my recent tour-report (tour to USA) and mentioned orally to Chairman, I find it difficult to describe my sadness and depression about the fate of Space Technology in the country. I am glad in a way to note Rs 326 Crores have been "allotted" under the Five Year Plan (78-83) which will perhaps remain a draft giving effect to the worst interpretation of the rolling plan (That is a different question). But does this allotment of Rs 326 Crores to Space mean a clear policy on Space or for that matter on S&T? May be it is good not to insist on policy and work "our" way through - day-to-day and year-to-year.

2.0 But what I am worried about is the fact that Space technology world over is fast maturing into a good commercial proposition and there is a lot of idle capacity in the USA and Western Europe pushing around for business - in shuttle, communication satellites, earth station, etc. Commerce & politics being closely intertwined, I am afraid that pressures may build up to constrain, if not, scuttle the India's Space programme. No USA Govt. official (NASA, DOD etc) and top business men hide the fact (in fact they stressed it) that one of their major reasons for STS programme is to maintain US leadership in S&T and high technology products.

3.0 Considering briefly the (socially) positive aspects of US Space programme, the Space technology in a span of two decades have reached a vast segment of non-specialists who are now able to think of harnessing it for various national (US) needs. Such a fast dispersion of a new technology into the public domain, would really give hope to a society - better morale at least. The "New Leftists" in the USA (and their mimickers in this country) may talk of technology - push and technology tiger.

...2/-

The fact remains that the American people have come out of their introspection and are enjoying the fruits of their high technology - at the cost of others who do not act around the globe (we also being ones) who do not act).

4.0 Every facet of STS presentation, the technology involved and the fact that many common persons (in USA) can conceive of and design systems of relevance, constantly reminded me of our state of affairs - ISRO, HAL (the sleeping giant), BEL, HEC (Ranchi), DRDO Labs, NAL etc. If these companies/agencies can be geared up we can make the country a reasonably good first-rate space power - not just to show its muscles but to build relevant systems in the country suited to its needs. It pained me to note that we do not seem to be in that direction. Then I have come to see the British Aero-Industry Symposium organised in a grand style to influence the fighter aircraft purchase. Something in me cries "Where are we heading for?"

5.0 Nearer home we have INSAT-1. We work hard for it and we will make it a success, no doubt. What is the future? Will the country make INSAT-2 or even INSAT-3 or will we be going around various Committees to determine the reliability of the indigenous systems, cost-effectiveness of build-buy options etc? On these counts indigenous technology will always have a disadvantage the way it is funded and administered. What is the credibility of man who has not done operational systems, in the eyes of a cold-minded executive? Will then the whole of ISRO be proposal-evaluators and monitors-of-contract? I abhor to think of a scenario when NRSA might import the space segment of Landsat.

6.0 So what is the role of indigenous development vis-a-vis operational systems? Are they to compete with the international cartels with the Indian Administrative machinery (DOS inclusive!) taking care of cost effectiveness, procedures etc? Or will there be a clear direction that the indigenous development will lead to such-and-such operational system by such-and-such year and one has to live with it and improve upon it. How come Chinese are putting their own geosynchronous communications satellites? I see some dark patches in the horizon which remind me of the fate of HAL and DRDO laboratories? Would ISRO (the symbol of self-reliant space effort) be reduced to these?

(1285)

7.0 I argued in my own mind on the other side too. Why do we need an indigenous technology? Why self-reliance in technology when so many are poor? Is not water supply to villages, & roads more important? Is this "bogy of self-reliant S&T" a pressure group of fat elites trying to carve out a crucial economic position for themselves? I don't hold brief for many of our irresponsible and avaricious scientists and science-administrators (who are so not because they are scientists, but because they are typical Indian middle class). But I am convinced in my mind that no society (especially bigger ones like India) can pull itself out of the rut without large-scale application of science and technology and that technology cannot grow without internal effort.

8.0 Internal effort cannot be developed without clear policy directions. Presently I see a trend that internal R&D in advanced technologies is merely done to develop a large-scale market of high technology products to be sold by the West, just as public sector investments open up a market for various indigenous private efforts. But unfortunately the Western companies have behind them the Western powers with their clear vision of the role of South Asia. I am not xenophobic but am trying to make a realistic appreciation of the geo-politics.

9.0 So "what are our goals? (and fate?)" is a question that is becoming louder and louder in me. Even military secrets and self-reliance in this crucial sector does not make this country to mount some effort in that sector for self-reliance. I can only place my views to you as Government procedures do not allow any other means; also forums in this country to discuss these are not found. I can only request that you do something if possible. As for myself I only hope I can carry with me the optimism I still have in me (even in mid-thirties) for 2 or 3 more decades.

Regards

(YS Rajan)

(1286)

If I look back at this note in Day[@] 2017, it has been a prophetic worry. Our planning and goal setting within ISRO, with the Planning Commission and Govt as a whole & had been within our own micro-internal considerations of availability of funds.

SD might have been worried about the ability to deliver; I have never come across a senior executive of ISRO (Director down) who was wanting to compare us with China, Japan, Europe USA & USSR. They were living in their own world of ~~the~~ winning within ISRO their projects and hold on to do it.

Unlike other organisations, one good thing about ISRO, was (is)

(1287)

that it did achieve the project completion (in later years during (1995 - 2005) there were slippages of even ISRO promised schedules).

During late 1970's ISRO had only a couple of projects. Mostly the schedules were kept up. ~~But~~ But there ~~was~~ were no greater ambitions. ~~At~~ At Delhi level, there ~~was~~ were no global comparisons of our achievements, targets etc.

That sadness what I reflect had continued in terms of ISRO's programme status. Though indigenous INSAT-2 came about, and Indian Remote Sensing Satellite (IRS) came about in 1988 to feed NRSA its data

(1288)

time also to the world, it remained
so for about a decade. ~~In the~~
day ~~at~~ upto 2000. But due to
lack of strategy to COMPARE with
our competitors in the world had
kept ISRO behind (India behind).
At one point of time ISRO came
to a good position in Remote Sensing
Data supply to the world and
applications.

Now China & other countries
let alone USA dominate that market.

Now @ 2017 there are three top

Space paras - civil, commercial
& military - USA, ~~USA~~ Russia
and China. India is no where

(1289)

Europe comes in fourth. ~~into~~
But India is nowhere near!
There is a wide gap. ~~This~~
This 'lag' started around 1978
as India was still with ~~a~~ its
rudimentary stage. Apparently
there was no political will and
no understanding at the administrative,
policy making levels. SD would
have been full aware of these
limitations and took a pragmatic
decision of doing whatever we
can, within the funds we ~~can~~ ^{could}
hopefully get.

It is sad that even
now @ 2016 / 2017 there is no understanding

(1290)

about this ~~group~~ wide gap. We are proud of ~~Mars~~ Chandrayan-1, Mars mission MOM Mangalyaan,

107 satellites launched in one vehicle with world record etc.

China, which was lagging behind us in satellite technology, which suffered more sanctions from USA has now mastered all space applications; they have their own systems and also do commercially satellites for others. Of course in launch vehicles they have full capability while India is still struggling with its GSLV.

I won't blame SD for

(1291)

not acting. Indian elite establishment
is to blame; they continue to be
so, is the great tragedy!! (@2017)

Coming ~~to~~ down from the
~~overall~~ overview (or strategic thinking
note above) I had started my
routine of pushing ISRO to achieve
better at least at the current
level. There were both technical
and managerial / administrative
issues.

A note (handwritten)
dated ~~30~~ 3/6/78 "Some important
management actions required to be
done" Attached as next pages

3/6/78
Handwritten
notes

(1292, 1293, ... 1297)

→

1298

23/3/6/78 For Chairman's use only (1292)

Sub:- SOME IMPORTANT MANAGEMENT ACTIONS REQUIRED TO BE DONE

Item (1) The burning question/issue is a replacement for Dr. BP. Once Govt saved us giving breathing time. Now Nature is giving gentle warnings. Even if Dr. BP recovers fully, he should not be loaded. Hence a need for urgent replacement. The criteria for selection could be :-

- (a) SLV-3 should not be disturbed
- (b) There should be some general respect for the person and less fears about the person.
- (c) Should be philosophically ready to restrict manpower & building growth at Trivandrum and should be ready to move towards Systems Mgmt.
- (d) Should be capable of inspiring the SLV-Variant team.
- (e) Should have a good rapport with SHAR.
- (f) Most importantly, the person should have respect and care for Kalam, the achiever. And in a future Structure Kalam should have a prominent place. [P.T.]

In an effort to accommodate "seniors" splitting VSSC is not good. It will lead to ^{more} interagency rivalries. VSSC has been integrated in a premises. The only rationale for splitting could be if the units are shifted to another distant location.

Item 2

Relocation of RFF preferably into 3 or 4 segments separated for some identified tasks and some shifting of personnel ~~is~~ are a must. Almost the next burning task.

Item 3

Third in line is the decision about liquid activities. The location of the liquid test facilities and the formation of liquid engine team formally. We should not let them dither further.

Item 4

For SLV-Variant activities an overall - in - charge and a Project

Director need to be named soon, with a small core team to move the activities. (Chairman will get a list of schedules with key events soon).

Item 5

IRS needs formal organising. Most urgent need is to orient SAC towards users. I have written to Shri Kamat as I mentioned to Chairman. The present mode of aerial surveys - with operations & R&D mixed up - is no longer conducive to growth and user interface. A person to direct satellites too needs to be named; may perhaps wait.

Item 6

RSR - decisions to move out its activities to private industry and HAL etc is a must at least to meet MONEX time frame. There is a need to decouple it from RFF to meet schedules and quality.

Item 7

APPLE project needs strengthening with an idea to find (grow) a new part.

Project Director: May be P. Ramachandran, if he joins, could be promoted to SF and made P.D. ~~of~~ after seeing him for say 3 or 4 months [This will be an out-of-turn promotion].

Vasagam should be still overall-in-charge (say Chairman of the Board) and should be named Dy. Director, ISAE. His intellectual stature, which is so valuable, can be better utilised that way. His role should not be confused by naming others also as Dy. Directors.

Item 8

Radars project management including the personnel in the project to be drastically reorganised. This is not only to meet SLV-3 schedules but also to be ready for SLAR. (Both technologies have a lot in common). Either Calla with a strong deputy or may be Dr. Kosta to placed under Shri Pant or Calla could be a solution.

Item 9

A review of SLV-3 readiness and SEO by Chairman say by July 78 end would speed up the projects. He should announce it too, to keep the heat on.

Item 10

A person to take charge of STEX (now that Sudhakar has refused to go) need to be found out soon. Director, SHAR will be trying to find out. He has collected a list of SF engineers with background in rocketry and mechanical engineering. Chairman needs to accelerate the process.

URGENT BUT LONG TERM ISSUES

ITEM 11

Movement of senior and middle level scientists between Centres is a definite need ~~for~~ the long term health of the organisation — to create more objectivity in the working culture.

Item 12

The linkages with industry needs to be pursued more aggressively without excessive obsession on royalties etc as is being done now. The holding company needs to be formed soon [P.T.O]

Item 13

Eventhough ^{the} Services do not press for it, the linkages between ISRO/DOS and the future national defence needs to be raised at Govt level for instructions. ~~From~~ ^{from now} five years ISRO/DOS and Defence will each need the other Do we wait till then without a plan of action?

Item 14

There are propensities with DOS and some of the ISRO top administration (esp. ^{the} deputationists) to bureaucratise ISRO. Unless some formalisms of ISRO Council, Chairman ISRO etc are done, some day DOS may try to run ISRO and its Scientists. Coupled with these arrangements are the powers of Directors and the role of ISRO HQ. (Present access by Scientists to Secretary, DOS has kept the DOS under leash; but it does not mean we have a stable system!)

More ^{items} will come as the above as solved!!

Rajan

3/6/78

To be added here
Six pages.

(1298)

I don't recall when I was designated as Scientific Secretary ISRO by issue of an order. But I was de facto doing ~~most~~ all such jobs. In many way I thought PDB was the first SS, ISRO, it was during my time from ASS to SS the role of SS got expanded in many directions.

Even the ~~promote~~ papers concerning Senior Scientists (much senior to me) had to be prepared by me. SD was going to talk to Dr. BP on the matter at Bombay (where BP was resting after ~~his~~ he recovered from his stroke and resting.)

Attached below ^{handwritten} ~~the~~ my note to SD dt. 5/6/78 - SD's note in red - his table to be filled. Warnier he refers to there is N.V.G. Warnier, Adm. Officer of ~~the~~ ISRO HR (previously PS to VAS)

↳ 1299, 1300, 1301, 1302

(1299)

Rejan: It would be
useful if someone can
Tabulate data on the
forms I have included.
You can ask Warrior/Isrom
to do this. - I need it before
14th when I will see Dr. B.
Bombay. Q.

For Chairman's use only (1300) 5/6/78

Sub: Some data on very senior Scientists of ISRO

Chairman had asked me some data of year of promotion etc of senior persons in ISRO. Data in a tabular form is placed below.

For Chairman's quick reference ISRO grades are

SC / SD / SE / SF / SG / G / H / [↑] / [↑] / ³⁰⁰⁰ / ³⁵⁰⁰

Shri Pant & Dr. Gupta joined as SE's. Dr. VRG & Dr. BSRao joined as SF's.

The list in the table is on the basis of 'seniority' considered in terms of the years in the ^{present} grade - G.

This is one way of looking at it. Govt has some other - not always consistent - view of number of years also with a mix of seniority in the last grade.

Prof. Bhavsar & Prof. KRao got their Ph.D's as under:

Prof PDB - 1957 Prof WRR - 1960

Probably one can ~~can~~ consider their number of years in PRL/ISRO after that. (They were abroad about 4 yrs for Prof WRR & about 5 yrs for PDB).

In case of Prof Chitnis / Prof. PDB / Prof WRR the years in PRL counts not merely administratively but also because in some way they served ISRO being in PRL. Their formal joining of ISRO (per se) was later to others.

Should Chairman need some other information, I will do as instructed. (Persons like Kalam, Kump etc are in SG Grade; I mention this for completion of the picture).

Rajan

5/6/78

P.S: Chairman may also note that some have completed 5 years in the present grade.

Raja
5/6/78