

The Vision for Space Exploration -- Potential Russian Roles

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Pros and Cons of Space Partnerships

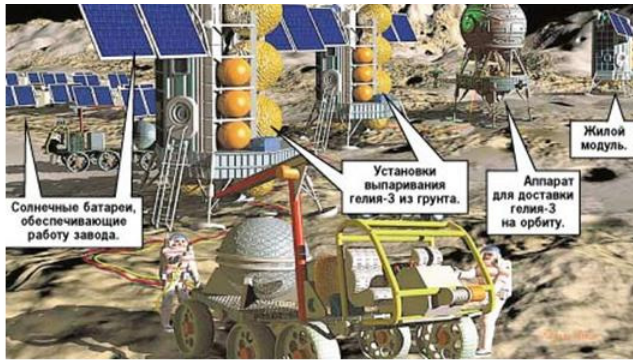
- Saving costs by sharing the load
- Speeding up through combined efforts
- Quality enhancement via greater 'experience base' to extract 'lessons learned' and novel ideas
- Deeper redundancy from having unrelated ways to achieve complementary functions
- Domestic political and budgetary support due to foreign obligations
- Diplomatic tool via reward-punish mechanism
- Technical intelligence value of 'inside views'

US experience vis-à-vis Russia [Downside]

- Hidden costs overwhelmed promised savings, e.g. STS performance penalty
- Interface efforts took much longer than predicted and cost far more than hoped
- Despite explicit congressional directives and White House assurances, NASA put Russia right athwart 'critical path'
- Soaring ISS costs sucked money out of STS upgrades and safety improvements
- For 5% of the contribution, Russia gets ~40% of the services of the facility.
- Foreign sales provided Russia billions of dollars and provided critical funding support, allowing expenditures on other projects, mainly military
- Space community attitude was to take credit for improved US-Russian relations rather than realize they reflected the improvement – analogy of crowing cock and the sunrise.

US experience vis-à-vis Russia [Upside]

- Critical robustness provided by contribution of redundant services from different technological base. EG, CO2 scrubbing, EVA, ground-to-space transportation, A/G communications, toilets, etc
- Worker-to-worker contacts enhanced appreciation of 'other ideas' during period when US space effort was exclusively focused on STS operations
- Partners lost most illusions and misconceptions about each other's space industry, intentions.
- During difficult periods, obligation to partners carried substantial domestic political weight



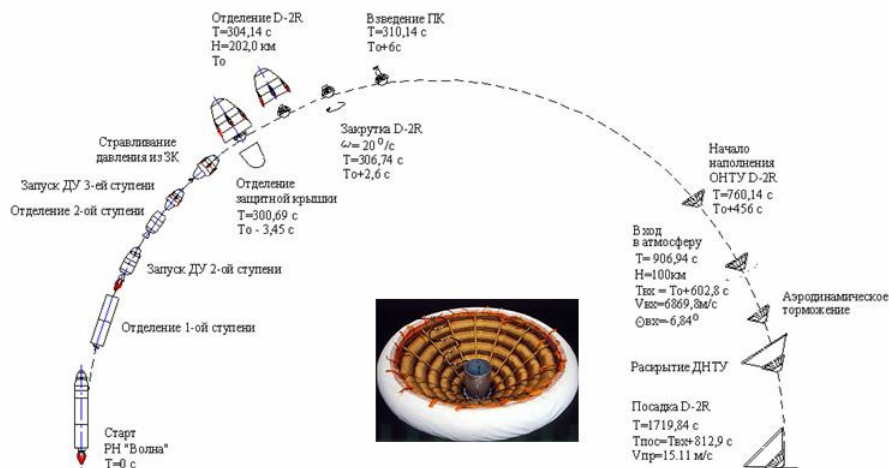
Unfortunately,
it's a rip-off



The Russian moon
artwork (top) was
'adapted' from a
US artist (bottom),
and no 'helium
connection'

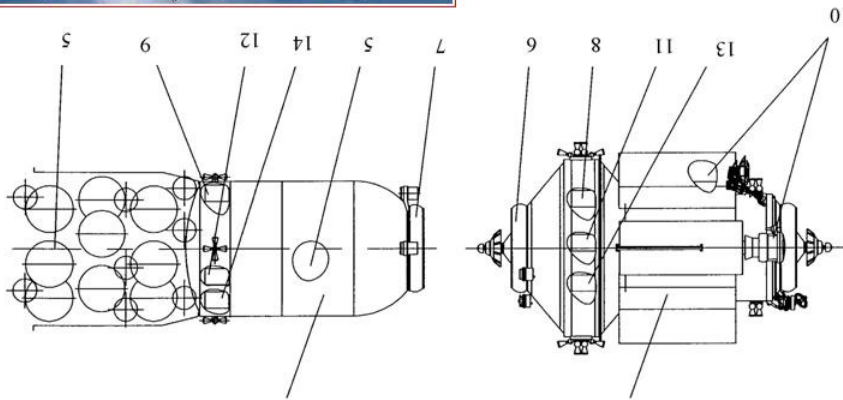


'Demonstrator'

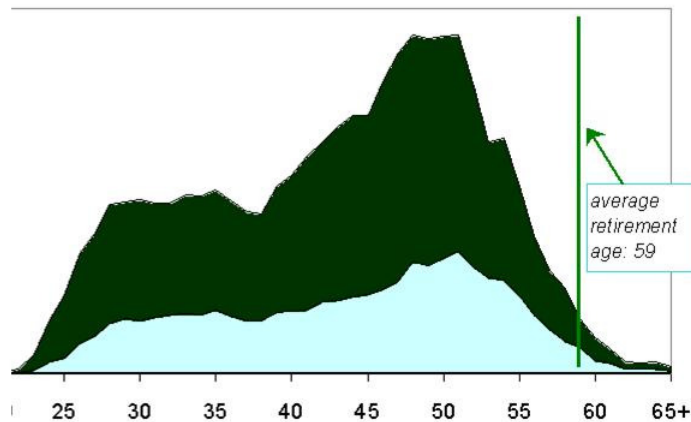




Parom (patent pending)



“Time bomb” – Russian mortality



This age distribution chart adapted from another population entirely – but it illustrates the looming problem that is even worse than shown here. The hump has already arrived at '59', which is not the 'retirement age, it's the male life expectancy