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# The Efficient Utilization of Open Source Information

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# Primary Considerations

- Open source information consists of a vast set of information from a variety of sources.
  - World news
  - Unclassified documents and reports
  - Maps and Satellite imagery
  - Patents, scientific papers etc.
- Not only does the quantity of open source information pose a problem, the *quality* of such information can hinder efforts.
  - Usually difficult to verify

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# The Method of Solving Problems

- In many cases, limitations in content prevents analysts from finding an exact answer to a question.
- One important problem solving strategy is to bound a system's capability or technologies.
- By using additional valuable information, more refined bounds can be built, allowing for more precise estimates.
- Two example problems are found in examinations of Iran and North Korea

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# Case Study: Iran

- Consider the Iranian space program.
- Iran has demonstrated a satellite launch capability using the domestically produced Safir rocket family.



Images: Safir  
Rockets (1, 2).



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# Case Study: Iran (Cont.)

- Given the success of Safir launches, could Iran utilize or modify existing satellite launch vehicles (SLVs) into ICBMs?
- What are key factors to consider when analyzing a ballistic missile?
  - Size of deliverable
  - Range
- Using these parameters, a  $\Delta v$  for the missile system can be defined for a given mass.

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# Case Study: Iran (Cont.)

- What is a good estimate for the mass of a reentry vehicle (RV)?
- How can we arrive at that estimation?

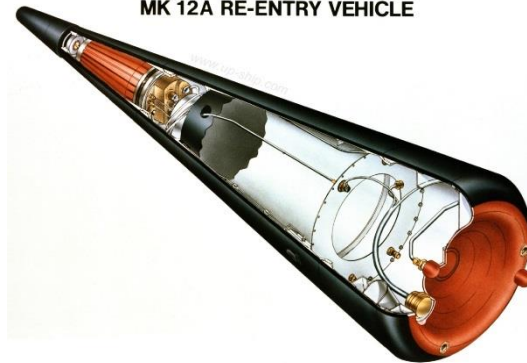
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# Case Study: Iran (Cont.)



MK 12A RE-ENTRY VEHICLE



Selection of US RVs (L to R: Mk 6, Mk 12a, Mk 21).  
Not great analogies for a first Iranian RV (3,4,5).

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# Case Study: Iran (Cont.)

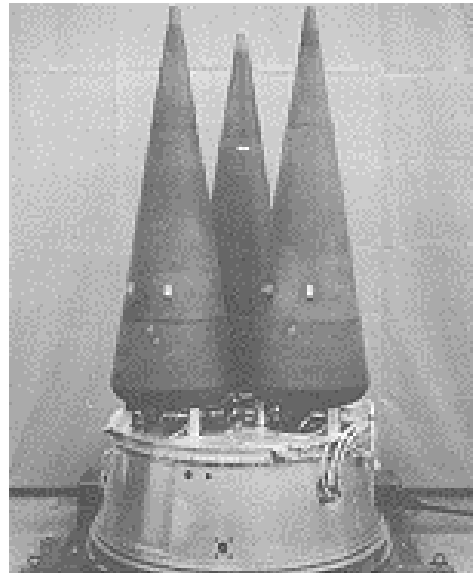
- We can estimate materials and sub-systems, using relatively small (in volume) US systems.
  - Safing, arming, fuzing, firing (SAFF)
  - Special nuclear material
  - High explosives
  - RV shell
  - plastics/foams/etc.
  - Others?
- Using these, and weighting by volume, a lower mass bound was estimated at 740-1150 lbs.

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# Case Study: Iran (Cont.)

- Minuteman III throw weight is ~2400 lbs



Minuteman III  
with 3 Mk 12a  
RVs (6)

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# Case Study: Iran (Cont.)

- Using this mass, a Safir system does not have the required  $\Delta v$  needed to reach necessary apogee to be considered an ICBM.
- A comparison with western missiles of the same capability yields a bounded estimate (in time) of when Iran could have a nuclear capable ICBM.

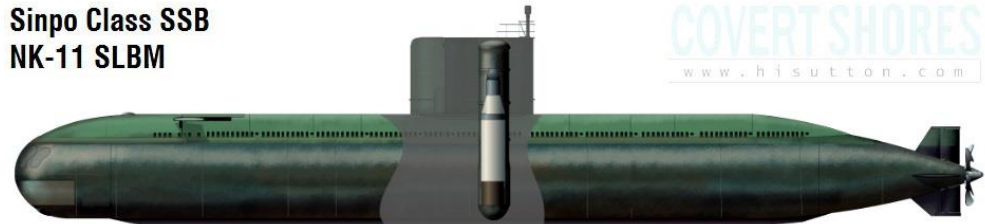
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# Case Study: North Korea

- Consider the naval capabilities of the DPRK.
- How long would it take for the DPRK to successfully develop a reliable SLBM capability?



Sinpo Class SSB  
NK-11 SLBM



NK-11 Missile ejection and estimate of Sinpo-Class SSB (7,8).

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# Case Study: North Korea (Cont.)

- In similar fashion to the Iran case, what does the DPRK need to achieve its goal?
  - A nuclear weapon. (Deliverable/miniaturized)
  - Reliable SLBM system
  - SSB(N)
  - Supporting technology for SLBMs and SSB(N)s
- How long would it take for the DPRK to successfully develop a reliable SLBM capability?

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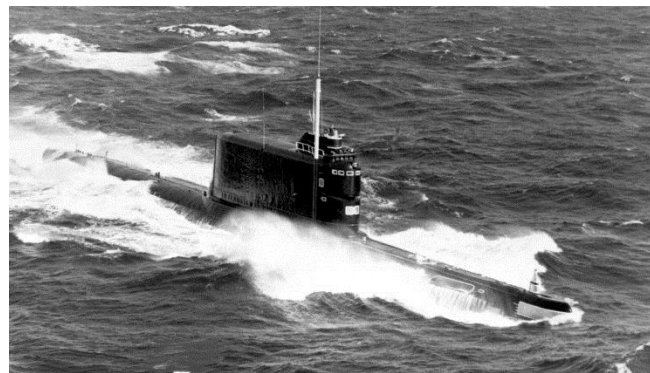
# Case Study: North Korea (Cont.)

- North Korea has made some fairly substantial claims...
  - Claim of “Hydrogen Bomb” test, Jan 2016 (BBC).
  - Claim of being about to fully “cope with America with nuclear weapons at any time” (CNN).
- North Korean rhetoric alone will not provide an accurate understanding of capabilities.
- Important to consider that posturing can be geared both for domestic propaganda or foreign intimidation.

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# Case Study: North Korea (Cont.)

- Reality: Primarily using maps and satellite imagery as the source of information:
  - ~ One Sinpo Class submarine (assumed operational)
  - Testing of SLBMs initially only platform based.
- Check through tracking tech transfers (Golf II, R-27)



Golf II class  
submarine  
(USSR) (9)

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# Case Study: North Korea (Cont.)

- Similarly to the Iran case, a comparison to Western development provides a minimum bound for the time needed to have a credible SLBM capability.
  - What is the difference between a “usable” capability and a “reliable” capability?

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# Case Study: North Korea (Cont.)

- SSBNs, instead of SSBs, allow for a more flexible deterrent for several reasons
  - Quiet
  - Long(er) deployment times
  - Longer effective range
- However, all of the required infrastructure for a naval nuclear reactor is certainly not trivial.
- The domestic production timeframe on an SSBN class likely exceeds a decade.

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# Conclusions

- The huge breadth and depth of open source information can complicate an analysis, especially because open information has no guarantee of accuracy
- Open source information can provide key insights either directly or indirectly:
  - Looking at supporting factors (flow of scientists, products and waste from mines, government budgets, etc.)
  - Direct factors (statements, tests, deployments)

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# Conclusions (Cont.)

- Fundamentally, it is the independent verification of information that allows for a more complete picture to be formed.
- Overlapping sources allow for more precise bounds on times, weights, temperatures, yields or other issues of interest in order to determine capability.
- Ultimately, a “good” answer almost never comes from an individual, but rather requires the utilization of a wide range of skill sets held by a team of people.

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# Picture and Graph Credits

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# Additional References

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- B. <http://www.cnn.com/2015/09/15/asia/north-korea-nuclear-program/>

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