



Israel and a Nuclear Iran: *To be or not to be?*

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Admiralty Trilogy Seminar



Outline

◆ Iran's Nuclear Program

- Timeline
- Why are they pursuing it?
- A Threat? To Whom?

◆ Responses

◆ Israel's Military Options

- Getting There
- A "Deal" Deal

◆ Israel's Forces

◆ Iran's Defenses

- Organization
- Sensors
- Fighters
- SAMs & AAA

◆ Targets in Iran

- Nuclear Targets
- Oil Targets

◆ Iran's Responses

- Military
- Asymmetric

◆ Fallout (Consequences)

- Military
- Economic
- Diplomatic

◆ Who Will Win?

- Israel
- Iran
- The rest of us

◆ *Persian Incursion*

- An exploratory game



Iran's Nuclear Program

◆ Timeline:

- **1957: Started under the Shah, part of US-sponsored “Atoms for Peace”**
- **1968: Iran signs NPT, Ratifies in 1970**
- **1970s: Expansion with US, French, Belgian, Spanish, German, South Africa help**
- **1979: Islamic Revolution- all deals canceled**
 - **Ayatollah Khomeini declares nuclear weapons un-Islamic**
- **1980: Start of Iran-Iraq war, lasting until 1988**
 - **Bushehr reactor heavily damaged by Iraqi attacks**
- **1981-93: Iran conducts bench scale research into uranium compounds including uranium dioxide and uranium hexafluoride**
- **1988-95: Iran conducts centrifuge R&D at the Tehran Nuclear Research Center**
- **1990: Iran signs 10-year cooperation agreement with China**
- **1994-96: Iran receives shipments of centrifuge components and drawings for P-1 centrifuges and drawings for P-2 centrifuges from Pakistan**
- **1997: Russia begin construction of a VVER-1000 power reactor at Bushehr**
- **2000 - 2001: Iran begins construction of Natanz enrichment facility, Arak heavy water plant, and Gachin mine and ore processing mill**
- **2002: Confirmation of nuclear facilities at Natanz and Arak**
- **2003: Iran begins uranium enrichment tests at Natanz**



Iran's Nuclear Program

◆ Timeline:

- **2003: IAEA gets suspicious, investigates**
- **2004: Iran begins constructing a heavy water reactor at Arak**
- **2004: IAEA publishes report of Iran's breaches of the NPT**
- **2005: IAEA Board of Governors, rules Iran to be in non-compliance**
- **2006: Arak heavy water facility is completed, two production lines**
- **2006: First 164-machine cascade comes on line at Natanz Pilot Plant**
- **Late 2007: Eighteen cascades in operation, achieve an enrichment level of 3.6%**
- **2009: Fuel Manufacturing Plant completed**
- **2009: Natanz has 8,692 centrifuges installed in underground halls (53 cascades)**
- **2007, 2009, 2010: UN sanctions**

◆ Significant foreign assistance

- **Pakistan - A.Q. Khan network provides centrifuge components and plans**
- **China - UF₆, plans for uranium conversion facility, zirconium production plant**
- **North Korea - ballistic missile technology**
- **Russia - Pressurized (light) water power reactors**



Why are they pursuing it?

- ◆ **Iran's recent history (19th and 20th centuries) is one of foreign domination**
 - **Russia, Britain, US; including coups engineered by GB and the US**
- ◆ **The Revolutionary government still sees itself in confrontation with US**
- ◆ **Militarily inferior compared to any likely opponent - and they know it**
- ◆ **Poor industrial and technological base, especially after the damage of Iran-Iraq War; R&D brings in new technology**
- ◆ **Horrendous losses in Iran-Iraq War, including Iraqi chemical weapons**
- ◆ **They want to exercise leadership of the Muslim world**
- ◆ **Admission to exclusive “nuclear club.” - RESPECT**
- ◆ **Muslim balance to Israel's nuclear weapons**



A Threat? To Whom?

◆ A nuclear Iran could:

- **Keep a bomb in place as a symbol of national power**
- **Engage in nuclear blackmail**
- **Give it to a terrorist group**
- **Arm a ballistic missile**
 - **Saudi Arabia, most GCC, Israel, & Turkey are currently in range**
 - **Possibly all of Europe if reports of BM-25 Musadan IRBMs are true**

◆ Intentions?

- **Little talk of deterrence**
- **Pasdaran control both the ballistic missile forces and the nuclear program**
- **They will almost certainly be given control of any weapons**
- **Ahmadinejad speaks of “Destroying the State of Israel”**
 - **Nobody in the religious leadership contradicts him**
- **State philosophy is geared toward confrontation**
- **Not necessarily afraid of nuclear retaliation**
 - **Twelver Shia Islam has strong apocalyptic streak**

◆ “Nuclear diffusion”



Responses

- ◆ **Diplomatic initiatives: Nobody wants Iran to have nuclear weapons except Iran. Why is it so hard to stop them?**
- ◆ **Diplomatic pressure turns into economic considerations**
 - Oil and gas reserves buys Iran a lot of clout
 - Until recently, Russia and China blocked any serious economic sanctions
 - Spotty coverage, easily bypassed, sometimes ignored
 - Russia now supports sanctions, changed mind shortly after Obama admin changed plans to base BMD capable radars & missiles in Poland, Czech Republic
 - China continues to stall, seeming to agree to UN resolutions, but always encouraging more discussions
 - Why?
 - Iranian Oil - 15% of China's oil imports; significant investment in NG fields
 - Distraction and embarrassment of the West
- ◆ **Potential for Change?**
 - None



Responses

◆ **Military Options:**

- **Economic blockade of Iran - might be effective, if UN supported it (see China above), but technically is an act of war**
 - **Iran would retaliate**
- **Military attack on Iran**
 - **Compel them to discontinue**
 - **Destroy their capability**
 - **NOT regime change**

◆ **These inter-dependent responses and their potential outcomes are what exploratory gaming was designed to investigate**



Israel's Military Options

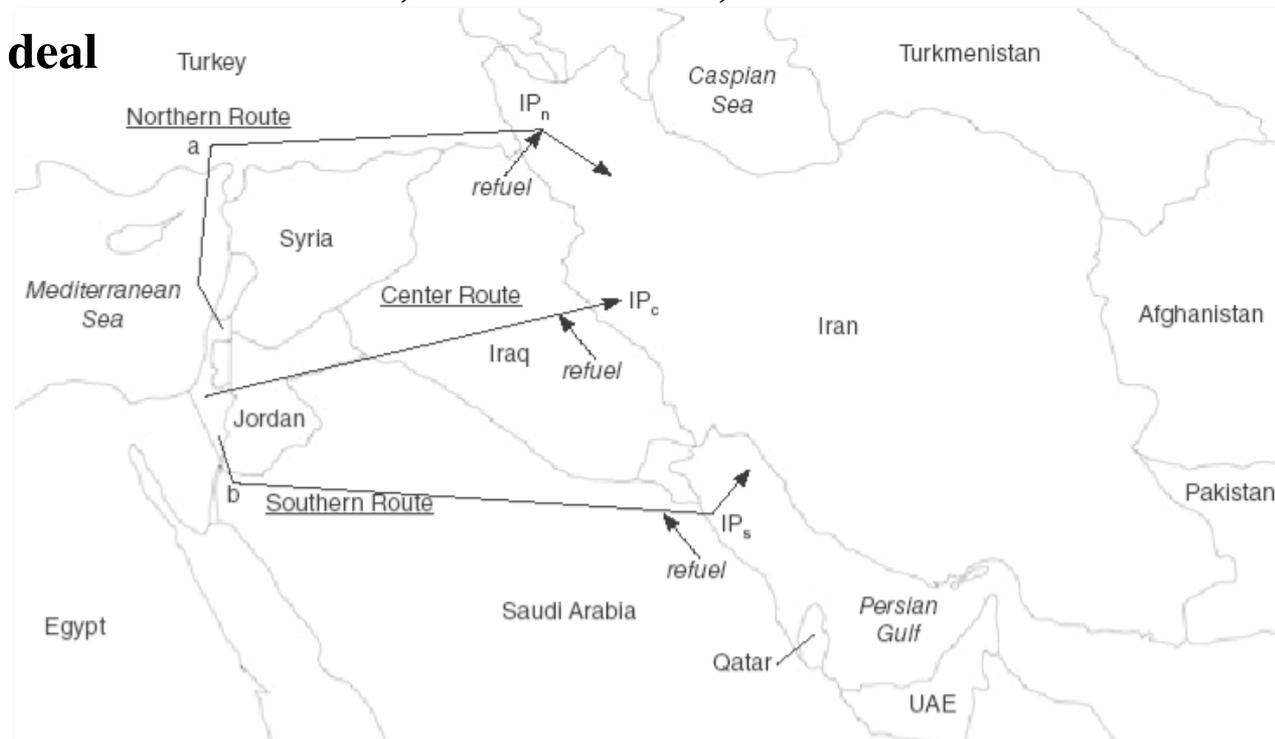
- ◆ **Israel expects to go it alone**
 - Strong history of acting unilaterally, then riding out world response
 - Barring extreme provocation, US will not act militarily against Iran
 - Europe, Asia, the Gulf Nations will not act
 - Their interests are not threatened - yet
- ◆ **Israel's ballistic missiles are not an option**
 - Conventional warheads don't pack enough punch, aren't accurate enough, and there aren't enough of them
- ◆ **Conventional air attacks with PGMs**
- ◆ **Advantages:**
 - Israel has the best air force in the region
 - Iran's air defenses are weak at best
 - Targets are away from civilian areas
- ◆ **Disadvantages:**
 - Requires over flight of other countries to reach Iran
 - Captured pilots would be valuable pawns for Iran
 - Any attack, even if successful, allows Iran to play the victim





Getting There

- ◆ **Getting there is much more than half the problem**
- ◆ **Three Routes - North, Central, South**
 - **Over fly Turkey, Iraq, Saudi Arabia**
 - **Avoid Syria and Jordan as much as possible**
- ◆ **Not just transiting air strikes - tankers, recce aircraft, CSAR**
- ◆ **Israel has to make a deal**





“A Deal Deal”

- ◆ **All three nations - Turkey, Iraq, Saudi Arabia have a lot in common**
 - Muslim populations - not inclined to cut Israel any slack
 - Opposed to Iran acquiring nuclear weapons
 - Shaky leaderships opposed to Iran exporting its revolutionary ideology
- ◆ **Israel does not have to convince the population, just the leadership; then let the leadership deal with the population**
- ◆ **Bribes are an option - Israel could:**
 - Abandon its nuclear program
 - Major concessions on Palestinian issue
 - Share defense technology
 - Share really good intelligence - hard evidence of Iran’s nuclear program
- ◆ **Without support of one of three countries, the campaign can’t happen; A one-time over flight, but not extended operations**
- ◆ **Israel has to really, really want to do this, which means compelling evidence of a threat - a last resort**
 - They have to see whatever price they pay as worth it



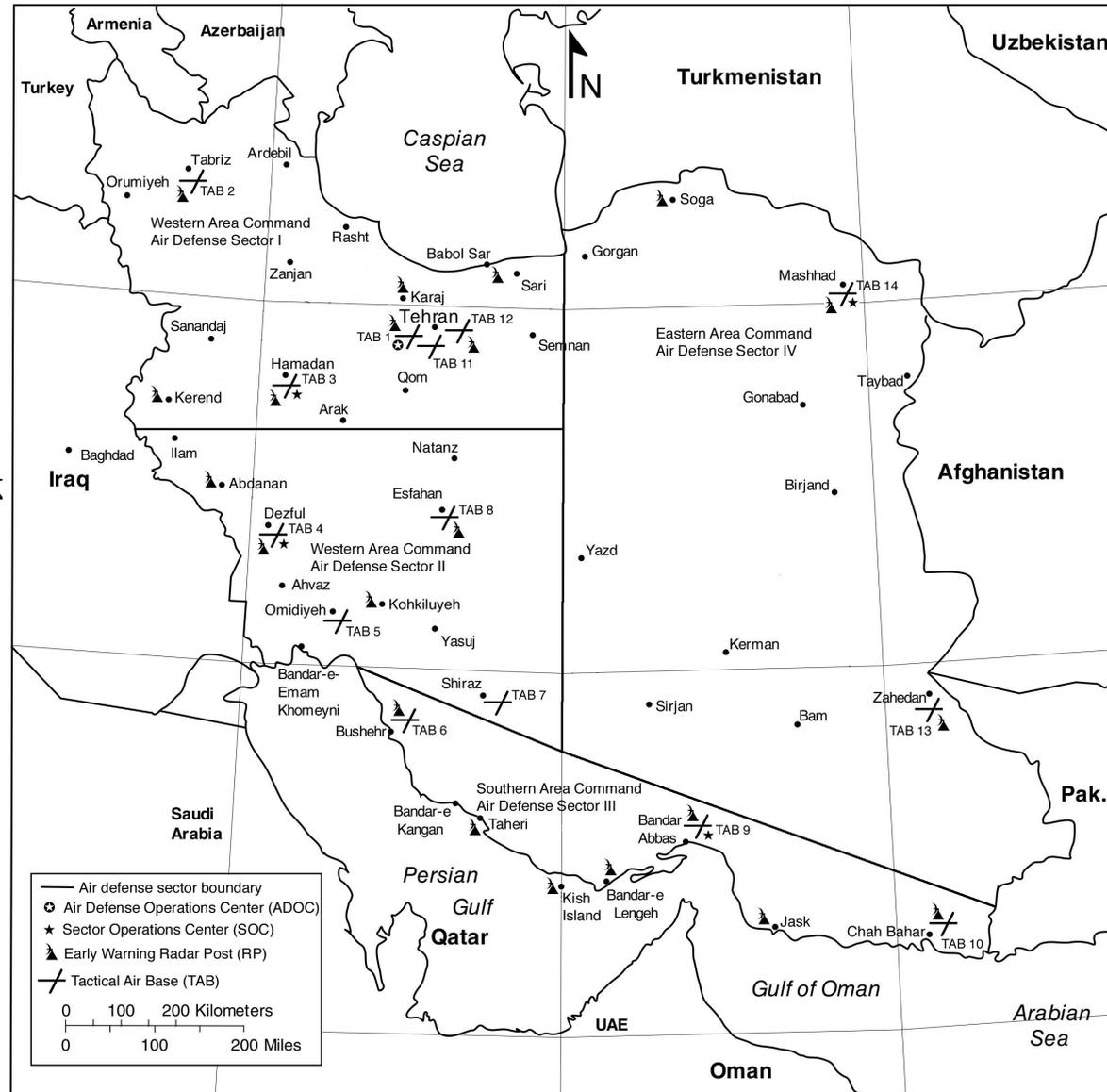
Israel's Forces

- ◆ **One squadron of F-15I Ra' am, four squadrons of F-16I Soufa**
 - **F-15I : 69th at Hatzerim**
 - **F-16I: 107th at Hatzerim, 119th, 201st, 253rd at Ramon**
 - **24 planes per squadron**
 - **First-line EW and avionics**
 - **Conformal tanks**
 - **AIM-120C-5, Python 5 AAMs**
 - **Range of PGMs, including EGBU-28, JDAM series, HARM, STAR-1**
 - **5 other squadrons of F-16C/D, 3 of F-15A/B/C/D, they can't reach**
- ◆ **Tanker fleet of 8 KC-707 Sankyee in 120th Squadron at Nevatim**
 - **Similar to KC-135, but without turbofan retrofit**
- ◆ **Gulfstream V Shavit SEMA in 122nd Squadron at Nevatim**
 - **Special Electronics Mission Aircraft**
 - **SIGINT, ELINT, Communications for a command staff**
 - **Probably Suter Attack capable**
- ◆ **IAI Eitan (Heron TP MALE UAV) in 200th Squadron at Palmachim**
 - **Variable payloads, including SIGINT, EO/IR sensors, SAR, EW**



Iran's Air Defenses

- ◆ **Separate air defense service “Khatam-ol-Anbia Air Defence Headquarters.” formed in 2009**
- ◆ **NOT an IADS - data is transmitted from sensors via voice or commercial data link**
- ◆ **Sector Operating Centers send everything to national level center in Tehran, retransmitted to other SOCs**
- ◆ **Poor coordination between sectors**





Air Defense Sensors

- ◆ **Radar: A mix of land-based systems dating back to the 1950s (US and UK) plus Soviet and Chinese systems**
 - Newest is the JY-14 [Great Wall] 1970s technology
 - Also Kolchuga passive electronic DF sensor
 - Not enough to cover entire border, even against non-stealthy aircraft
 - Mountainous terrain, especially in the north
- ◆ **Need AEW aircraft, but can't buy or build them**
 - Iraq Adnan-1 never operational, lost in collision





Iranian Fighter Strength

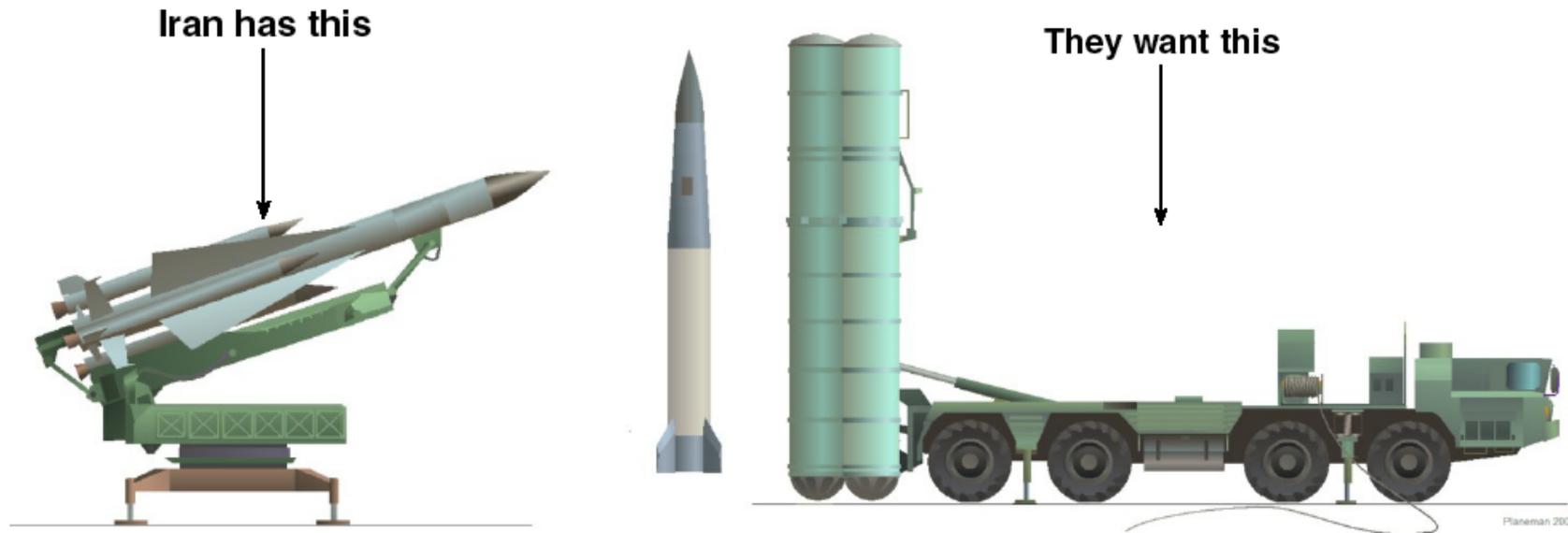
- ◆ **28 MiG-29 Fulcrums in two squadrons: 11th, 23rd**
 - R-27R [AA-10 Alamo], R-73 [AA-11 Archer]
- ◆ **36 F-14A Tomcats in three squadrons: 81st, 82nd, 83rd**
 - Detachments at TAB 1, TAB 2, TAB 6
 - AIM-54A Phoenix (?), AIM-7E-4 Sparrow, AIM-9P/Fatter
- ◆ **11/48 F-4D/E Phantom II in seven squadrons: 32nd, 33rd, 61st, 62nd, 91st, 92nd, 101st**
 - AIM-7E-2, AIM-9P/Fatter
- ◆ **58 F-5E/F Freedom Fighter in seven squadrons: 12th, 21st, 22nd, 41st, 42nd, 43rd, 71st**
 - AIM-9P/Fatter
 - Also 10 F-5A/B in 85th squadron
- ◆ **40 F-7M/FT-7N Airguard in three squadrons: 51st, 52nd, 53rd - IRGC**
 - PL-7 (R.550 Magic Clone)





Iranian Surface-to-Air Missiles

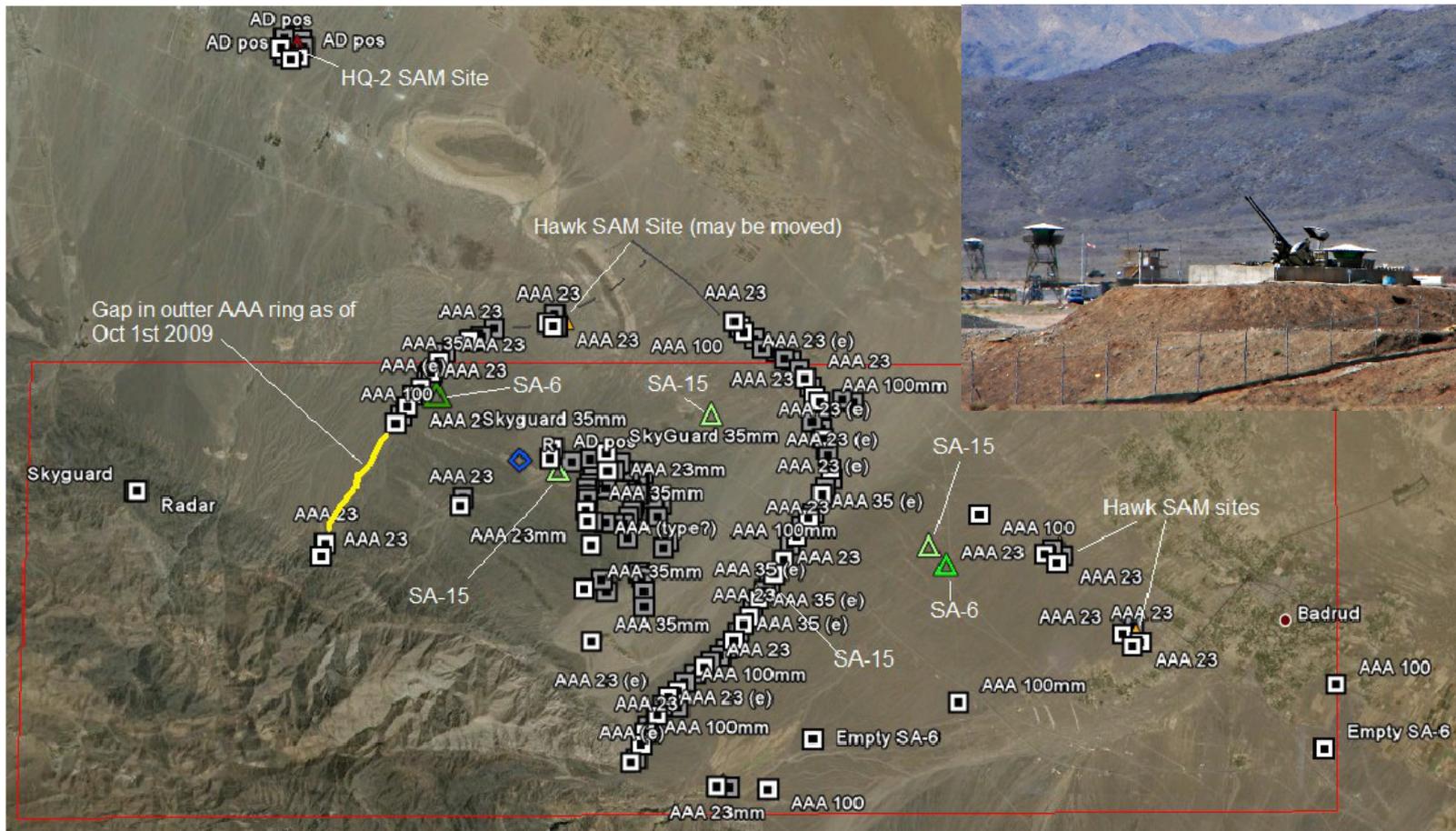
- ◆ **Long-Range: S-200VE Vega-E [SA-5b Gammon]**
 - Five sites: Three guarding Tehran, one each at Isfhan and Bushehr
 - Negotiating since before 2005 for S-300 purchase, Russians have stalled, just halted the sale - Chinese HQ-9 as an alternative?
- ◆ **Medium Range: I-Hawk, Kub-M3 [SA-6 Gainful], HQ-2 [PRC SA-2 Guideline]**
- ◆ **Short Range: Tor-M1**
- ◆ **Crappy Short-Range: Rapier, HQ-7/7A (FM-89/90 = Crotale clone), Tigercat**
- ◆ **MANPADS: RBS 70, Russian-built systems, PRC copies of Russian missiles**





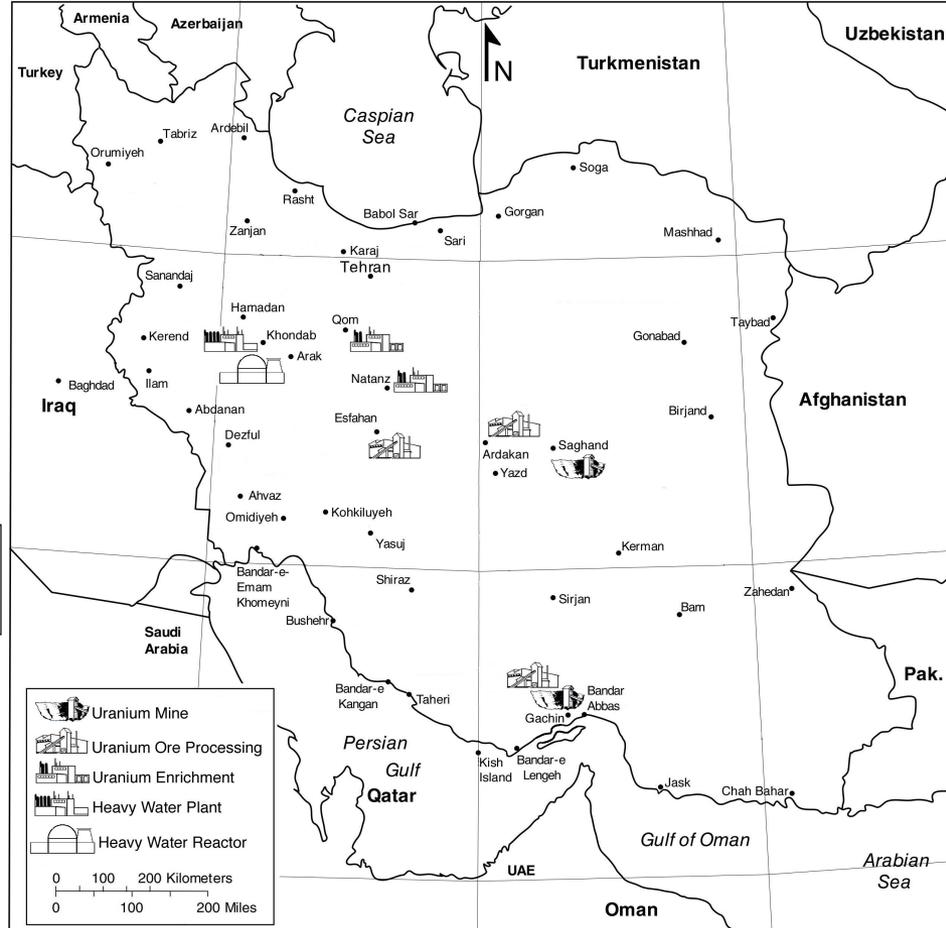
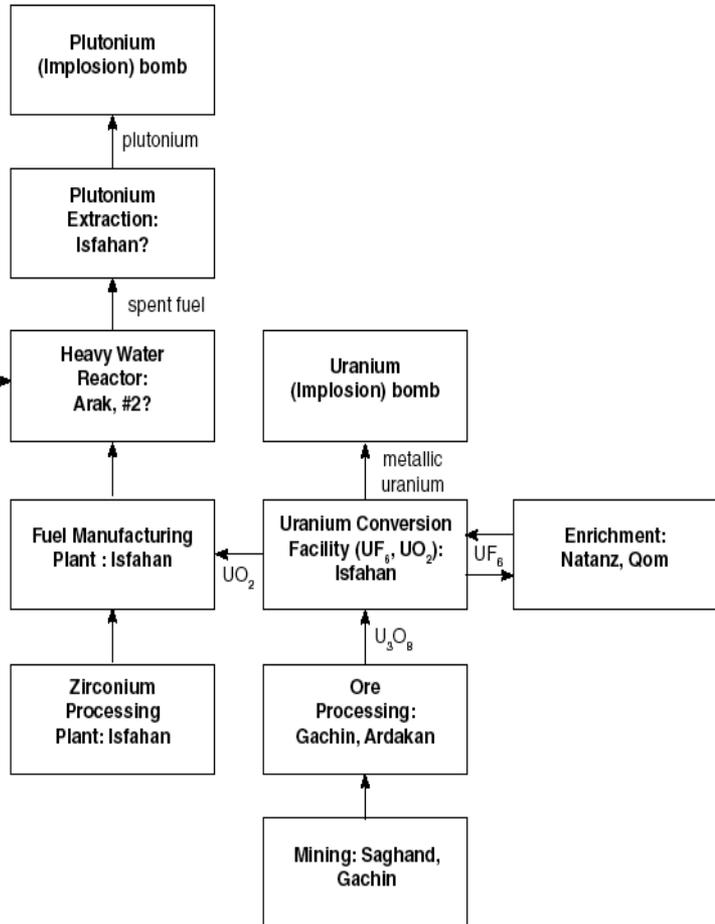
Iranian AAA

- ◆ **Most nuclear sites defended by a mix of 23mm and 35mm AAA - optically aimed; Backed up by a few Skyguard 35mm batteries**
 - **New automated KS-19s 100 mm starting to show up**

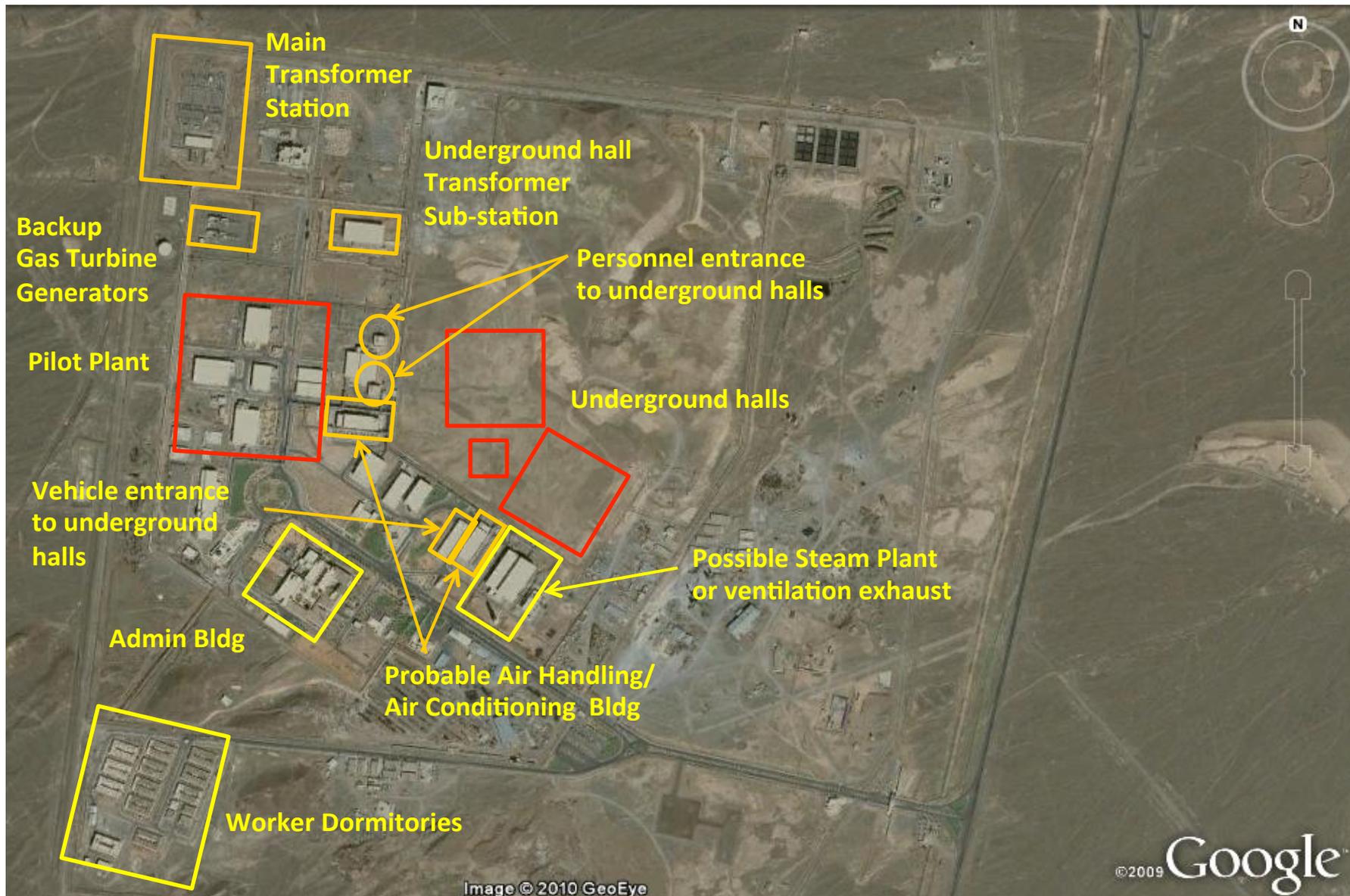




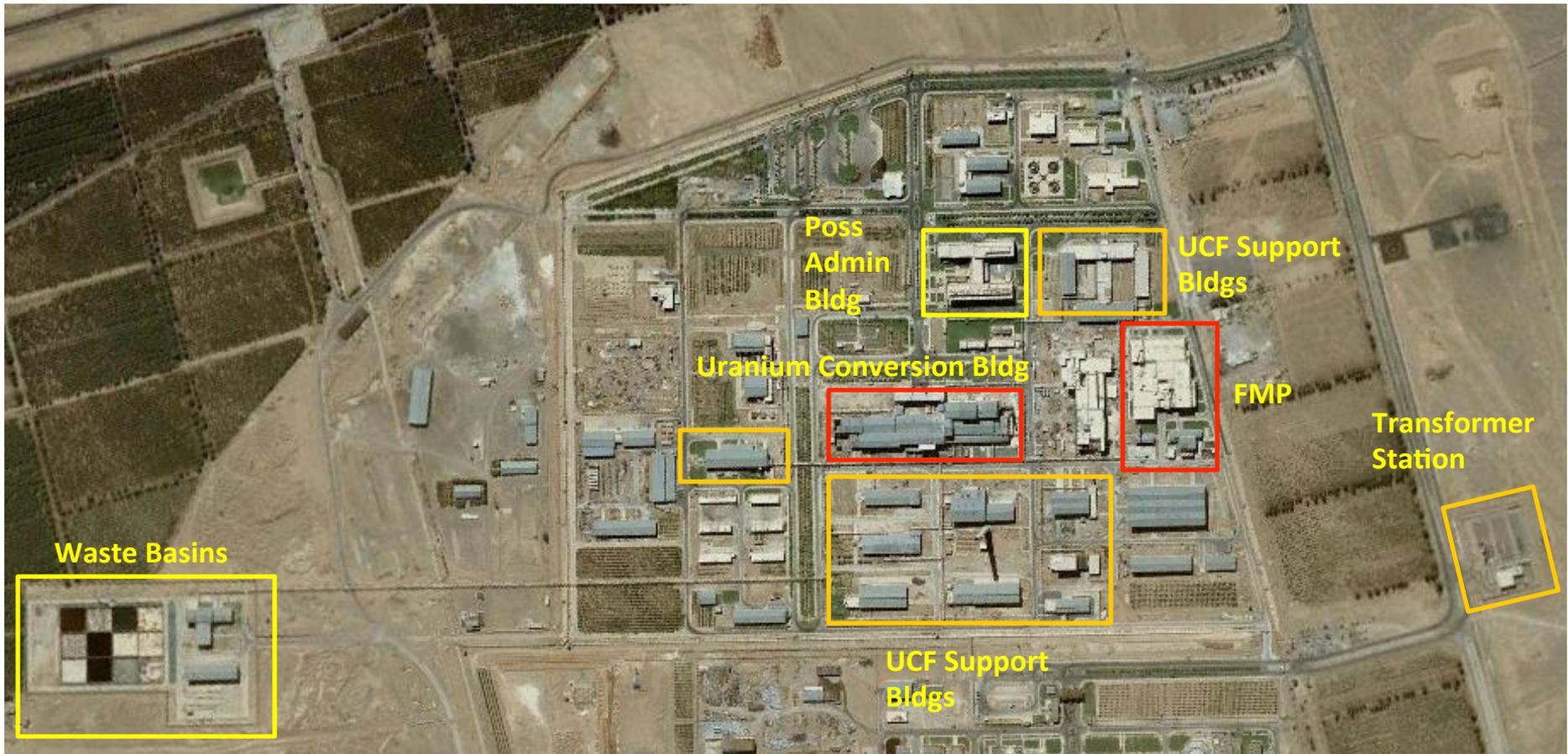
Iran's Nuclear Targets



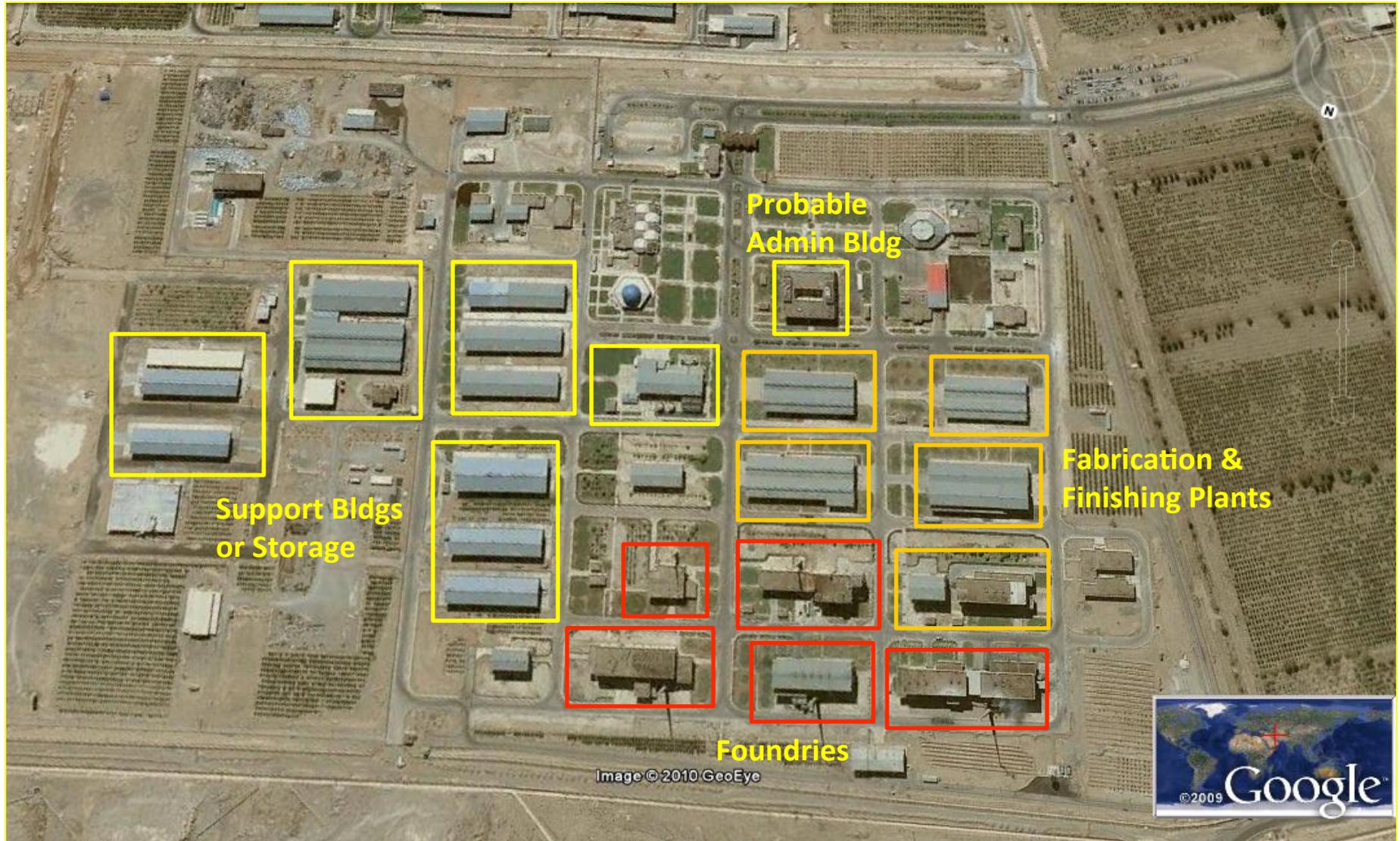
Natanz Uranium Enrichment Facility



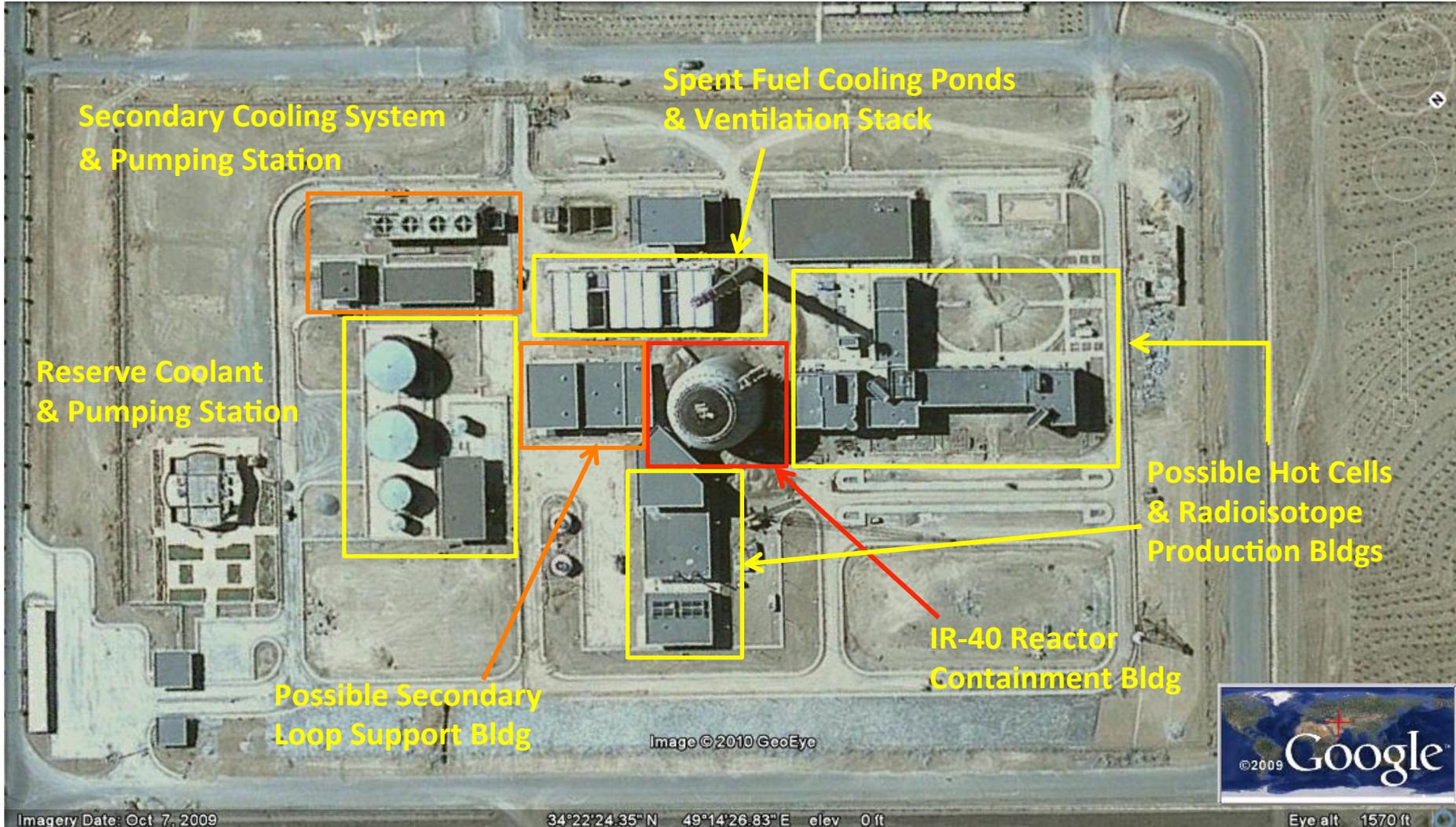
Isfahan UCF and FMP



Isfahan Zirconium Production Plant



Arak Heavy Water Reactor

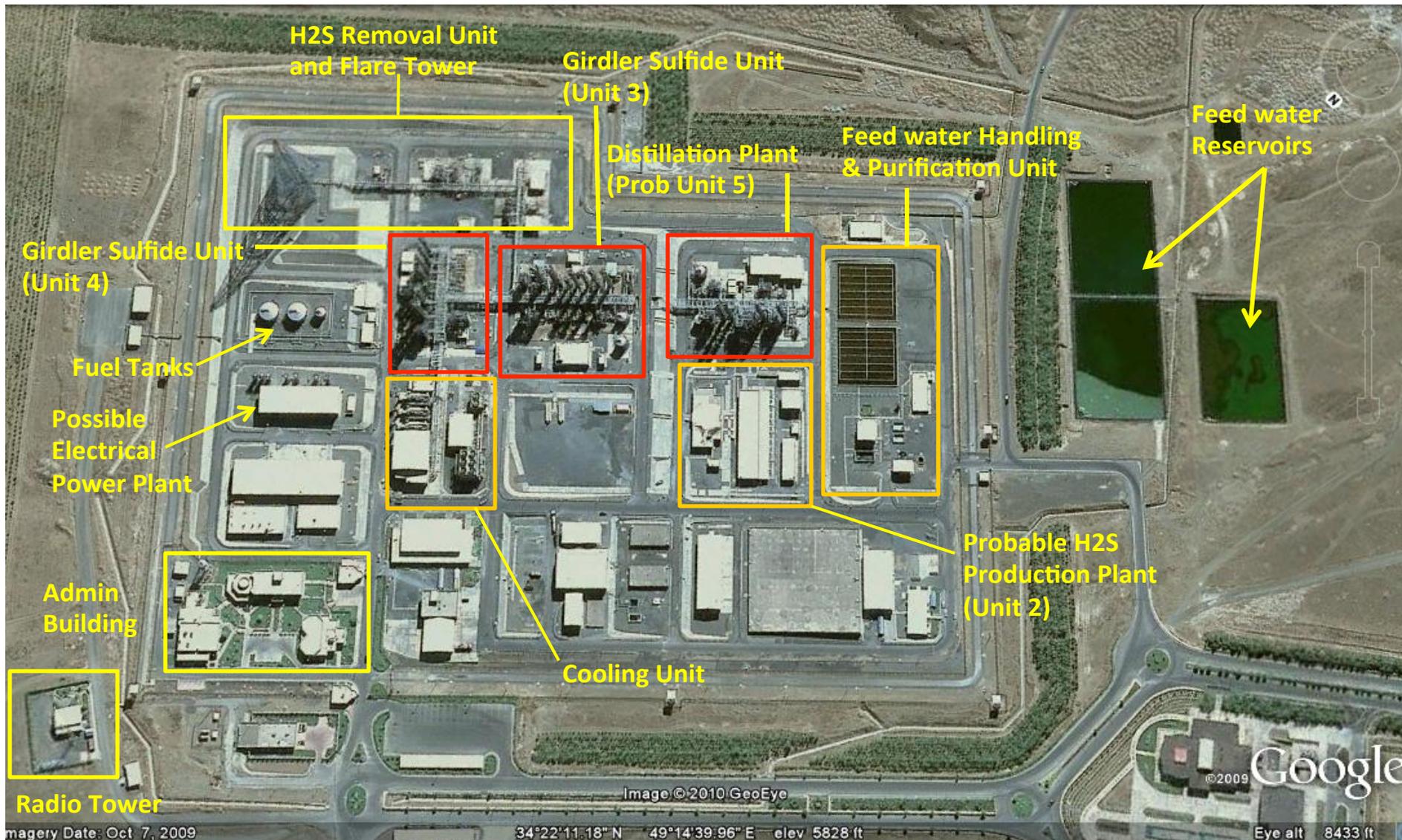


Imagery Date: Oct 7, 2009

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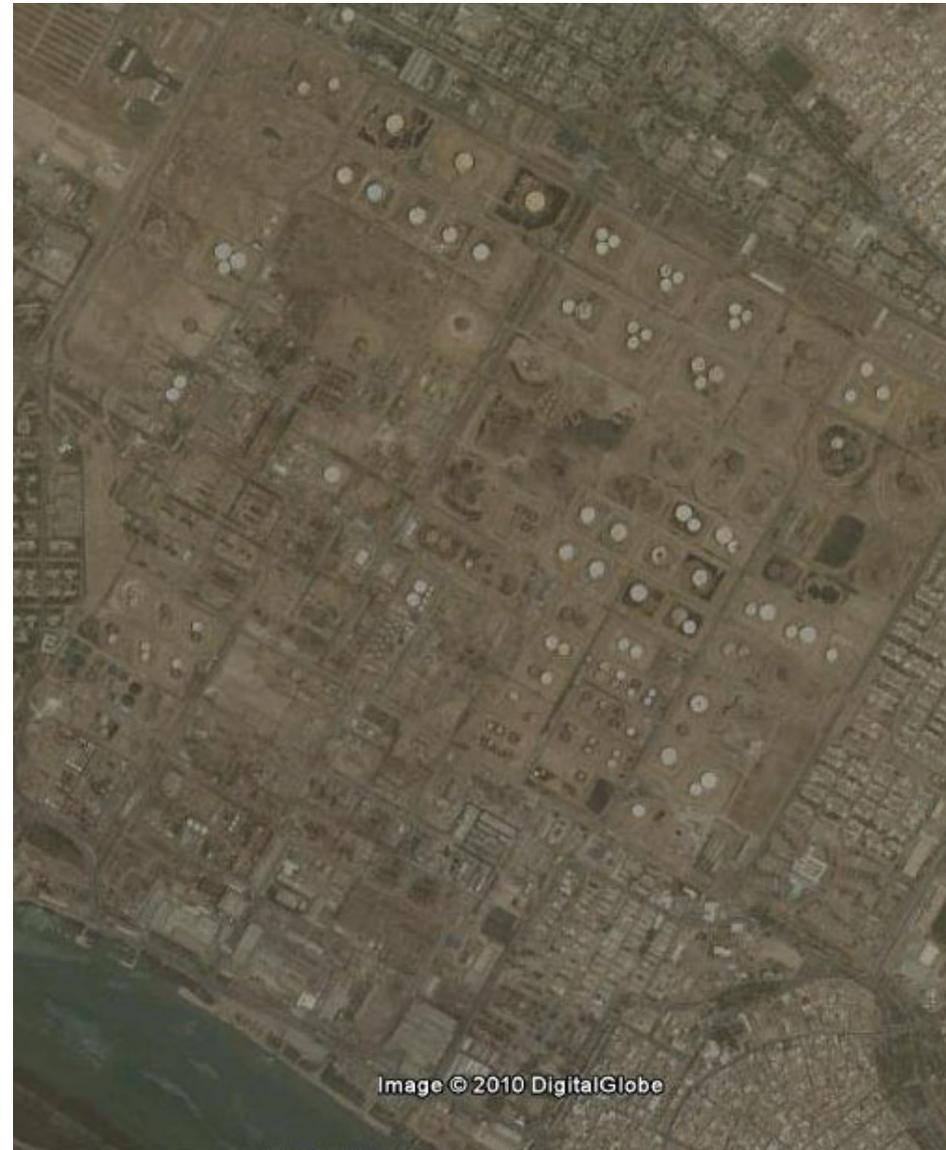
Arak Heavy Water Plant





Iran's Oil Economy

- ◆ **Only major export, supports both domestic economy and foreign sales**
- ◆ **Major vulnerabilities**
 - Still imports gasoline
 - Refineries are undefended
- ◆ **Still rebuilding after Iran-Iraq War**
 - Abadan peaked at 630Kbbls before the war, now up to 350 - 400Kbbls
 - 25% of production concentrated at Abadan
- ◆ **Vital for domestic policy**
 - Gas prices are subsidized
- ◆ **Vital for foreign policy**
 - China's support is based on oil
 - Oil buys nuclear technology





Iran's Oil Economy

◆ Oil export terminals

- Huge over capacity
 - Can pump far more oil than they can produce
 - Kharg Island - largest facility

◆ A Possible Target for Israelis?

◆ Risks

- Indirect attack - hard to justify self-defense
- Probably increase oil prices (even more)
- Hardships for Iranian population

◆ Advantages

- May cut off foreign support for Iran
- If Iran closes the Strait, this option becomes more viable
- Other oil-producing states would not object to raised prices, or Iran's problems
- Long term impact on Iran's economy
 - They still haven't fully recovered from the damage done during the war

Kharg Island



- ◆ **Six oil export terminals ≈ 9.2 million BBLs/day capacity**
 - **Kharg Island capacity ≈ 5.0 million BBLs/day**
 - **Nominal Iran crude oil production capacity is ≈ 2.6 million BBLs/day**



Iran's Response

◆ Military?

- Su-24s?
- Ballistic missile forces are the only arm that can strike directly at Israel
 - Terror weapon
 - Israel has significant BMD

◆ Closing the Hormuz Straits

- Tried this once before; didn't work

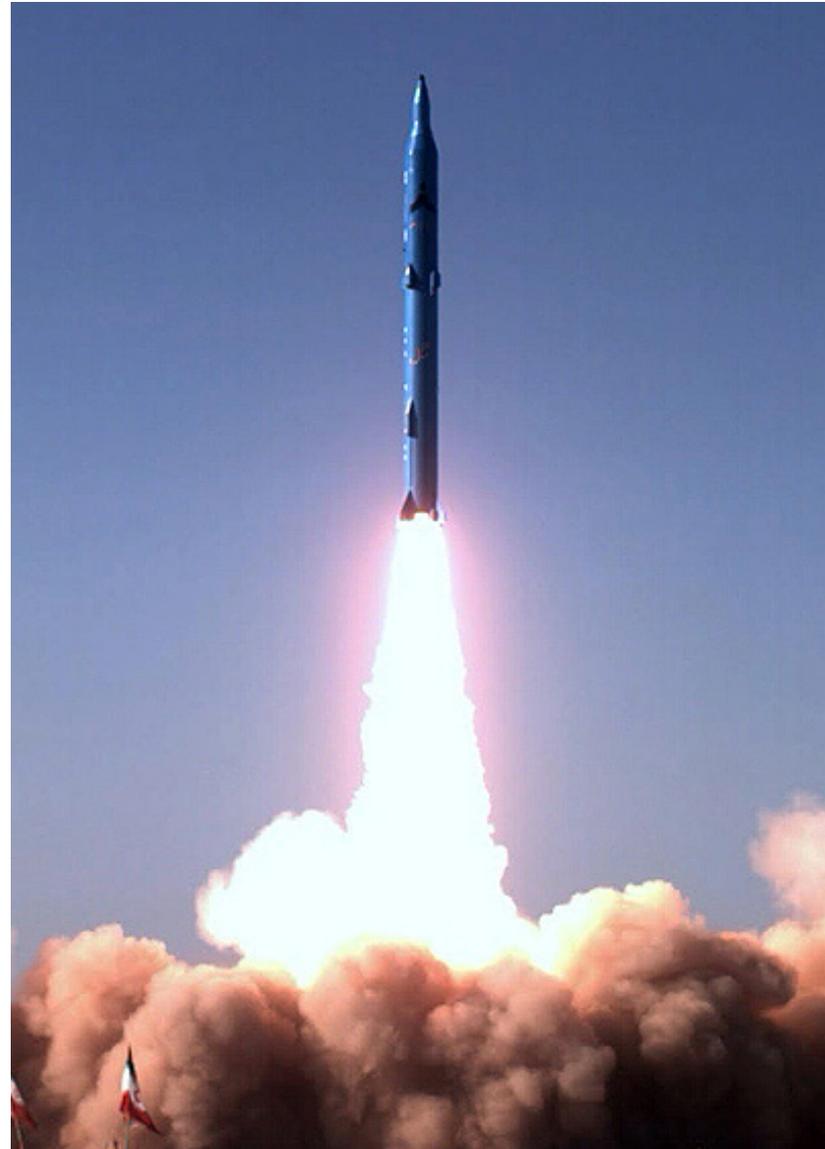
◆ Hamas, Hizbollah

- 2006 conflict showed it can work

◆ IRGC, Qods force

◆ Diplomatic offensive

- Will need Superpower backup





Military Option #1 - Ballistic Missiles

- ◆ **Controlled by the Pasdaran**
- ◆ **Experience in Iran-Iraq war, developed into a major arm**
- ◆ **Organized in brigades, with several battalions in each brigade**
 - **5th Ra' ad Shahab-3**
 - **7th Al-Hadid Shahab-1/2, Tondar-68 [M11]**
 - **19th Zolfaqar Fateh-110A**
 - **23rd Towhid Tondar-69 [CSS-8]**
- ◆ **Poor accuracy**
- ◆ **Little chance for Israeli actions against launchers or magazines**
 - **Flaming TELs make great video, but:**
 - **Hard to find in transit - signature of semi-tractor trailer**
 - **Best detectable is launch signature**
 - **Desert Storm, only 20% of 41 detections turned into 8 kills**
- ◆ **Best bet would be Eitan MALEs operating in hunter-killer teams**
- ◆ **Major Iranian disadvantage: Israeli Arrow-2 and Patriot PAC-3 batteries**

Khorramabad Ballistic Missile Complex

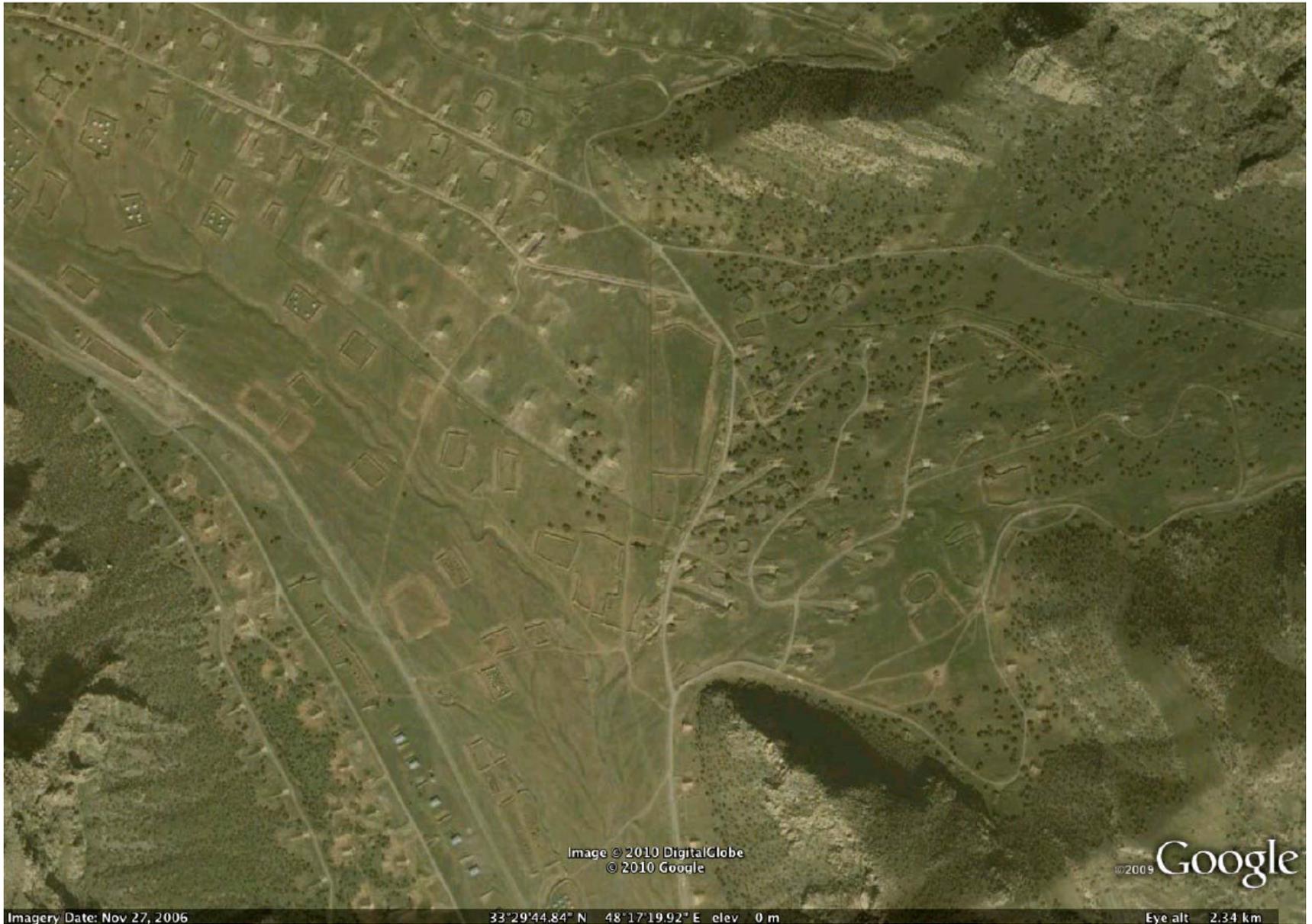


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Imagery Date: Nov 27, 2006

33°29'44.84" N 48°17'19.92" E elev. 0 m

Eye alt. 2.34 km



Military Option #2 - Closing the Strait

- ◆ This is a defensive move, the action of a weaker power
- ◆ Tried by IRIN and Pasdaran with MGs, RPGs & mines in Iran-Iraq War
- ◆ Did not go well for the Iranians before
 - Iran Ajr
 - Operation Praying Mantis
- ◆ “This time, we’ ll do better”
 - Small craft armed with C701s & torpedoes
 - Many C802 batteries
 - F-7s and Su-25s
- ◆ Really hard to sink a supertanker, but they don’ t have to
- ◆ US and UK says this would be an act of war
- ◆ Possibly a limited US response, but still widens the war





Asymmetric Responses

- ◆ **Energizes an already angry radical Islamist movement**
 - Closer alliance with Al Qaeda?
 - The enemy of my enemy is my friend
- ◆ **Dedicated use of proxies to directly attack Israel**
 - Hamas
 - Hizbollah
- ◆ **Information operations and diplomatic blitz**
 - Target the leaders who granted Israel over flight approval
 - Maximize use of collateral damage
 - Even if they have to create it themselves
- ◆ **Marginalize the US by “demonstrating” complicity with Israel**
- ◆ **If everyone loses, then we win**



Fallout (Consequences)

◆ Economic

- Oil prices will go up, even if Iran doesn't close the Strait of Hormuz
- If Iran does try to close the strait, could lose big or win big
- If Israel uses oil strategy, could cause collapse of Iranian economy

◆ Military

- Widespread use of ballistic missile defenses, as well as UAVs, cyber warfare
- Iranian military power tested - and fails?
- US, other Western powers could be drawn into the conflict

◆ Cyber

- War in the information age; Winner may be the side with the best videos
- Use of the web not just for propaganda or deception, but attack
- Iran limits/blocks use of the web; Will this hurt or help?

◆ Diplomatic

- Whatever USA's role, everybody is blaming us
- Severe test of US-Israeli relationship - possibly a lose-lose for Israel
- Al Qaeda will attempt to exploit the conflict



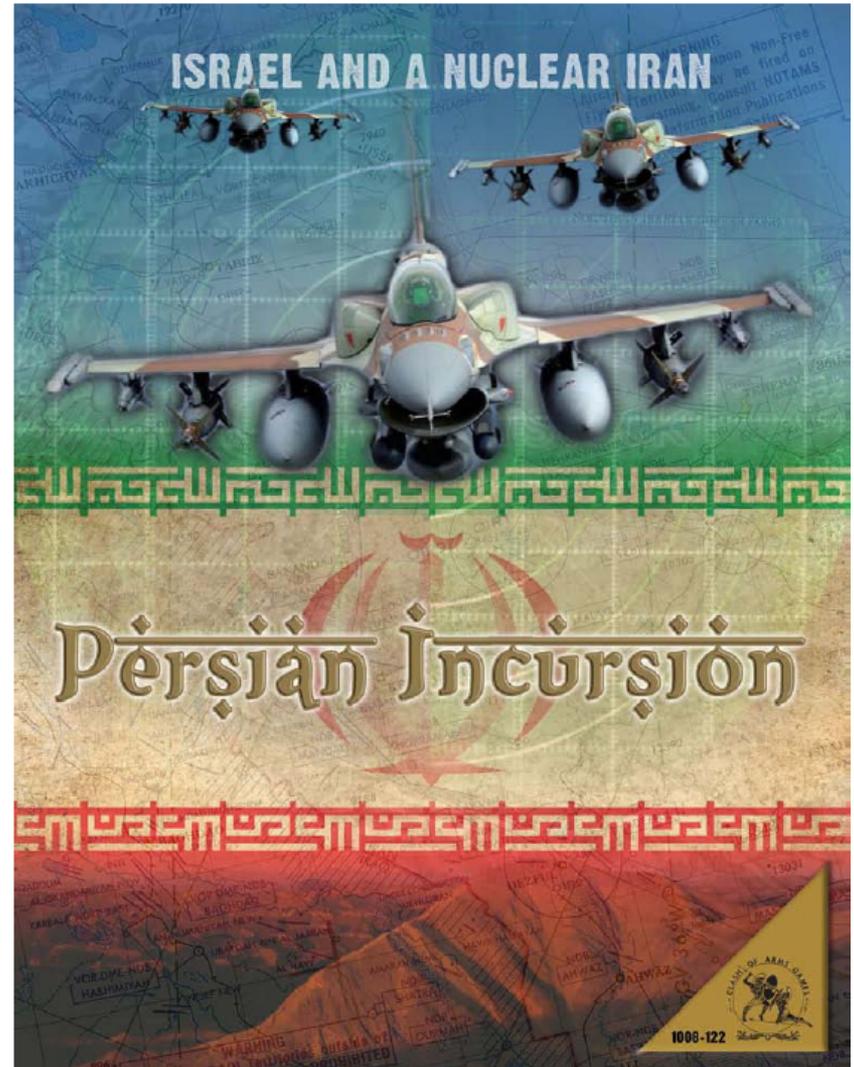
Who Will Win?

- ◆ **Israel?**
 - **Initiative**
 - **Military power**
 - **Israel will be isolated, even an Israeli victory may not be enough to recover**
- ◆ **Test of Israeli regime**
 - **Loss = new government? Again?**
- ◆ **Iran?**
 - **Moral high ground - they were the ones attacked**
 - **Can they just get by with surviving Israel's assault?**
- ◆ **Test of Iranian regime**
 - **Who are her real friends?**
 - **Big emphasis on military power - what if they can't deliver?**
- ◆ **And the rest of us?**
 - **Higher oil prices**
 - **Greater instability in the region**
- ◆ **Could be a lose - lose - lose situation**



Exploring the Possibilities

- ◆ ***Persian Incursion***
- ◆ **Uses *Harpoon* to resolve combat**
- ◆ **Military, Political, Intelligence actions**
 - Card based component
- ◆ **Maximizes uncertainty**
 - Variable political environments
 - Encourages player modifications
- ◆ **Military actions**
 - Air strikes
 - Ballistic missile attacks
 - Special warfare attacks
- ◆ **Political actions**
 - Domestic opinion
 - Regional players
 - World powers
 - UN



Questions?

