Coming to Grips With SAM Sites
July – Dec 1965

Presented by
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Lt Col USAF (Ret)

7th Triennial Vietnam Symposium
11 March 2011
July – Dec 1965

- Significant Period in Air Power History
- First Combat With Surface-to-Air Missiles
- U.S. Slow to Recognize SAM Threat
- U.S. Paid a High Price in Men and Planes
- Anti-SAM Tactics & Equipment Developed
Prologue
October 1962

- Nuclear Missile Threat From Cuba

Fidel Castro - President of Cuba

Nikita Khrushchev - Premier of Soviet Union
Prologue

- 24 SAM Sites Protecting MiG Bases and SS-4 Sites

San Julian Airfield SAM Site
Prologue

SAM Site
San Julian Airfield
Cuba
Prologue

- Executive Committee – EXCOM – Developed U.S. Strategy on Cuban Missiles
Key EXCOM Members Who Had Roles in SAM-Site Decisions in Vietnam:

- Lyndon B. Johnson
  Vice President

- Robert S. McNamara
  Sec of Defense

- Dean Rusk
  Sec of State

- Gen Maxwell Taylor
  JCS Chairman
EXCOM Developed 2 Options:

- Naval Blockade
- Air Strikes ... Under CINCLANT OPLAN 312
  - Then Invasion by 82nd & 101st ABN Divisions OPLAN 316
CINCLANT OPLAN 312

- Complete Destruction of Cuban AOB
- SAM Radars No. 1 Priority
- Then EW/GCI, Aircraft, AAA Sites
- Three Strikes, Multiple Waves
- 573 Strike Acft: F-105, F-100, F-84F, A-4D, AD (Skyraiders)
- Napalm, LAU-3, GAM-83, Iron Bombs
CINCLANT OPLAN 312 - USAF Strikes

Prologue

SHCL = Strike Hour Control Line (Cuban Air Defenses)
Prologue

- **21 Oct 62 – EXCOM Meeting**
- **Gen Sweeny (TAC CC) Briefed on OPLAN 312**
- **Kennedy: Be Prepared to Carry Out Attacks Within 24 Hours**

Fortunately

... 

- **26 Oct 62 – Khrushchev Offered to Remove Missiles if U.S. Didn’t Invade Cuba**
However ...

- Maj Rudolph Anderson, Jr. - KIA

- 1st Person Awarded Air Force Cross
Prologue

- Kennedy: Don’t Strike SAM Sites Yet
- Give Diplomacy a Chance
- 28 Oct 62 – Khrushchev: Russia Will Dismantle Nuc Missiles
- Diplomacy Precluded SAM Site Strikes in Cuba
July – Dec 1965
Air War Over North Vietnam
Rolling Thunder
Mar 1965 – Oct 68

- Sustained, Graduated Bombing of NVN
- Numbered “Phases”
- Each Phase Specified Targets & Rules of Engagement (ROEs)
Rolling Thunder

- Most Significant ROEs:
  - Hanoi Zones
    - Prohibited - 10 Nautical Miles
    - Restricted – 30 Nautical Miles
  - Strikes Directed by White House
April 1965

- U.S. Detected 5 SAM Sites in NVN ...

- All Within Hanoi’s Prohibited Zone

- Missiles Not Yet Installed
3 May 1965

- NVN 236th SAM Regiment Began Tng
- Formed 7 Jan 65
- Training Site Near Son Tay
- “... Highest National Priority”
- Seventy Soviet Missile Advisors
- Four Missile Launch Battalions ...
  61st 62nd 63rd 64th
April - May 1965

- Two CIA Directors ...

  John A. McConne
  29 Nov 61 - 28 Apr 65

  William F. Raborn
  28 Apr 65 – 30 Jun 66

... Recommended SAM Site Strikes

- The President & DoD Ignored Advice
April - May 1965

- EB-66s From Shaw AFB Arrived at Tan Son Nhut AB Then Went to Takhli RTAFB

- Detected SAM Radar Signals

- Warned F-105 & F-4 Strike Pilots
USAF Fighters

F-105D

F-4C
April - June 1965

- **USAF Added Fighters to Thai Bases**
  - 7 Apr – **45 TFS** 18 F-4Cs
    From MacDill to Ubon
  - 8 Apr – **563 TFS** 18 F-105s
    From McConnell to Takhli
  - 12 Jun – **357 TFS** 18 F-105s
    From McConnell to Korat
  - 15 Jun – **12 TFS** 18 F-105s
    From Kadena to Korat
  - 26 Jun – **80 TFS** 18 F-105s
    From Yokota to Takhli
May - July 1965

U.S. Gov’t Refused to Strike SAM Sites


- **25 May** – Rolling Thunder 16 Prohibited Strikes Against MiG Bases and SAM Sites

- **27 May** – JCS Recommended B-52s Bomb SAM Sites. McNamara: “Not yet. SAMs had not interfered with Rolling Thunder.”

- **26 June** – JCS to McNamara: Go After SAM Sites “… as they near operational status.” Denied.

- **3 July** – JCS to McNamara: Strike SAM sites before they are completed. Denied.
18 July 1965

- NVN's 236th SAM Reg. Completed Tng
- 63rd & 64th Battalions Moved to Two New SAM Sites 30 Miles NW of Hanoi
- Ringed Both Sites With AAA ~ 130 Guns
- Located in Path of Rolling Thunder Strikes
21 July 1965

- Two New SAM Sites Completed

**SAM Site 6 (64th)**

**SAM Site 7 (63rd)**

- Red River
- Black River
- Hanoi
- Prohibited Zone
SAM Site 7

Recon Photo Taken
20 July 65
NVN Sets Trap

- “... send our missile forces outside the Hanoi area ...”
- “... secure the element of surprise ...”
- “... conduct a mobile ambush ...”
- Have Available “... fake missiles ... made from bamboo and bamboo matting ...”
21 July 1965
NVN’s Trap

- **06:00 Hours**: AAA units “... were in position and ready to fight to protect the missiles ...”

- **20:30 Hours**: “... missile battalions were fully prepared and ready for battle ...”
23 July 1965
Friday

- 1st Day of Rolling Thunder 24
- EB-66s Detected New Fan Song Signals West of Hanoi

Coincidentally ...

- Advance Party of 47 TFS Arrived at Ubon to Replace 45 TFS (F-4Cs)
24 July 1965
Saturday

- Target: Lang Chi Munitions Factory (JCS 47.2)
24 July 1965
Lang Chi Munitions Factory

- Four Flights of F-105s from Takhli to Bomb Factory Storage Area
- Two Flights of F-4Cs From Ubon For MiG CAP
- F-4C Crew of “Leopard 02”:
  Capt Richard Paul "Pop" Keirn – 47 TFS
  Capt Roscoe Henry Fobair - 45 TFS
24 July 1965
1st SAM Shoot-Down

- RB-66C Detected SAM Radar Signals
- Called Warning: “Bluebells Ringing”
- 63rd & 64th Battalions Each Fired 2 SAMs
- Launches Controlled by Soviet Advisors
- F-4C 63-7599 “Leopard 02” - Direct Hit - Crashed
24 July 1965
1
SAM Shoot-Down

24 July – Vietnam Military Holiday
24 July 1965
F-4C “Leopard 02” Crew

- Keirn Ejected and Was Captured the Next Day
- Fobair Was KIA

Capt Keirn
POW

Capt Fobair
KIA
24 - 25 July 1965
NVN Reset Their Trap

- 63rd & 64th Batt’ns Moved to Other Sites
- Relocated by 10:00 AM 25 July
- AAA Guns & Dummy Missiles Remained
- Ready For Expected U.S. Retaliation
26 July 1965
NSC Decided on SAM Site Strikes

- **Two White House NSC Meetings**
  - VP Humphrey
  - Pres Johnson
  - Robert McNamara
  - Dean Rusk

- **Similar to EXCOM Debates During Cuban Crisis**
26 July 1965

NSC Decided on SAM Site Strikes

- Three Main Issues:
  - How Many Sites to Strike – 2, 3, or all 7
  - Soviet Union Reaction
  - Affects on Other Targets if SAM Sites Not Struck
26 July 1965
White House Decision

- Pres Johnson: If SAM Sites Not Destroyed, Rolling Thunder Targets Must be Removed.
- Unlike Cuba, No Diplomacy to Preclude Attack
- JCS Decided on Attacking Sites 6 & 7
- SAM Sites Blocked Rolling Thunder Targets
27 July 1965
“Operation Spring High”

- Four F-105 Squadrons Tasked to Strike Two SAM Sites – 12 Planes Each, 46 Total
- Korat – 357 TFS & 12 TFS – SAM Site 6
- Takhli – 563 TFS & 80 TFS – SAM Site 7
- Napalm, Rockets, & CBUs
- One of Air War’s Most Significant Missions ...

... Lessons Learned
27 July 1965
“Operation Spring High”

- Takhli to Attack SAM Site 7 From North

- Korat to Attack SAM Site 6 From South
27 July 1965
“Operation Spring High”

- Low Altitude Ingress – 50 feet, 500+ Kts
- AAA Burst Above Attacking F-105s
- NVN Gun Crews Hacked Down
  Earthen Berms To Fire Lower
- Four F-105s Downed in Target Area
27 July 1965
“Operation Spring High”

“Healey 02”
563 TFS
KIA

Capt Walter B. Kosko
27 July 1965

“Operation Spring High”

“Hudson 02”
563 TFS
POW

Capt Kile D. Berg

SAM Site 7
Coming To Grips With SAM Sites

W. Howard Plunkett

27 July 1965
“Operation Spring High”

SAM Site 6

“Cedar 02”
12 TFS
POW

Capt Robert B. Purcell
27 July 1965
“Operation Spring High”

“Dogwood 02”
12 TFS
Rescued

Capt Frank J. Tullo
27 July 1965
Tulio Rescue

- First Rescue Use of CH-3C Helicopter
- Tail Number 63-9685 - “Shed 85”
- Pilots - Capt George Martin, 1Lt Keese
27 July 1965

Tullo & His Rescuers

Capt Tullo

1Lt Keese

Capt Martin
27 July 1965
More F-105 Losses

- Two F-105s in Mid-Air Collision

Both 357 TFS Pilots Died

Capt William J. “Black Bart” Barthelmas, Jr.
Maj Jack G. Farr
27 July 1965
“Spring High” Results

- Six of 46 F-105s Lost (13%)
  - Three Pilots Killed
  - Two Pilots Captured
  - One Pilot Rescued

- Lessons Learned:
  - SAM Sites and Their AAA a Serious Threat
  - Major Improvements Needed
Aug - Dec 1965
Critical Period in Air War

- See-Saw Battles With SAM Sites
- Fast-Track Pentagon Tech Programs
6 August 1965
Rolling Thunder 26 & 27

- SAM Sites And Their AAA Guns Now on Target List

  But ...

- Only Those Outside Hanoi & Haiphong
11 August 1965
SAMs Scored Again

- SAMs Downed A-4E From USS Midway
- Lt JG Donald Hubert Brown, Jr. KIA
- NVN’s Second SAM Success
12 - 13 August 1965
“Operation Iron Hand”

- Navy Acft Hunted For SAM Site
- 124 Sorties Over Two Days
- AAA Downed 5 Acft, Damaged 7
- Three Pilots Rescued, Two KIA
- “Iron Hand” Became Name of All SAM Site Hunter-Killer Missions
12 - 13 August 1965

JCS & HQ USAF Anti-SAM Programs

- **JCS “Prong Tong” Study & Report**
  - Study North Vietnamese SAM Employment
  - Identify Short-Term Improvements to U.S. Air Ops
  - Study AAA Integration With SAM Defenses

- **Air Staff Formed a Task Force**
  - Study SAM Threat
  - Recommend Means for Coping With Threat
Air Staff Anti-SAM Task Force

- Headed by BG Kenneth C. “KC” Dempster

- Research Division, Directorate of Tactical Fighter Requirements (AF/RDQRT)

- 48 Years Old. WW II B-26 Pilot

- His Leadership Critical to All USAF Anti-SAM Programs
"What is the most effective means of neutralizing the threat posed by SAMS and the complementing heavy AAA in Southeast Asia?"
Air Staff Anti-SAM Task Force

Approach

- Accept Political Constraints, i.e. ROEs
- Two Time Frames:
  - Group A – Short Term Solutions
  - Group B – Longer Term Solutions
- Involve Contractors & Encourage All Ideas
- Expedite Procurement (QRC)
Eglin AFB Anti-SAM Seminar
16 – 18 Aug 1965

- USAF & Navy Agencies Briefed Their Programs
- Developed Concept of Operations For Special Anti-SAM Aircraft – Genesis Of Wild Weasels
- Recommended Near-Term Solutions:
  - Refine Navy’s Shrike Anti-Radiation Missile
  - Field ECM Radar Jamming Pods
  - Improve Radar Homing & Warning Systems (RHAW)
- Solutions Adopted by Dempster Committee
Shrike Radar-Homing Missile

- Navy Developed AGM-45 at China Lake
- Reached SEA in March 1966
Radar Jamming Pod

- Carried on Outboard Wing Stations of F-105s and F-4s

- Reached SEA in September 1966
Aug - Sept 1965
SAMs Growing Threat

- 18 SAM Sites Confirmed, 18 More Suspected
- Sites Camouflaged & Equipment Mobile
- Finding SAM Sites Was Main Problem
More F-105 Losses

- F-105 Pilots Continued Hunting for SAM Sites
  ... the Hard Way
- 16 Sept 65 – Two Losses to AAA on SAM–Site Search

Lt Col Robbie Risner  
Maj Ray Merritt  
CO of 67 TFS  
67 TFS

Both Pilots POWs.  
Released 12 Feb 73
20 & 23 Sept 1965
Pilots Learned to Avoid SAMs

- Navy And USAF Pilots Devised “SAM Break” Maneuver

- “...a high-speed dive past the rising missile, followed by a sharp pull up and change of direction.”
SAM Break Still Used

Airman Magazine
Summer 2005

“How To Dodge A Surface-To-Air Missile”

... In Your F-16
23 Sept 1965
Dempster Air Staff Committee
Anti-SAM Roadmap

- Seminal Document …
- Started USAF Programs to Counter the SAM Threat
- 22 Short-Term & 25 Long-Term Actions
- Identified Air Staff Action Offices
- Provided Priority, Direction & Funding
Dempster Committee
Anti-SAM Directives

- Develop Radar Homing & Warning Systems (RHAW) for Fighters
- Develop & Deploy “Hunter/Killer” Force. (Became Wild Weasels)
- Field Improved ECM Jamming Pods
Dempster Committee
Anti-SAM Program Management

- Used Quick Reaction Capability (QRC) Procedures

- Allowed Contractors to Work to “Best Commercial Practices“ Vs MILSPEC

- Program Managers Worked Fast, Communicated Informally, and Relied on Trust
Dempster Committee
Anti-SAM Program
USAF Program Manager

- Maj Irwin Joel “Pierre” Levy
- Worked For Gen Dempster in The Pentagon
- Electronic Warfare Expert
Dempster Committee
Anti-SAM Program
Contractor PM

- Applied Technology Corporation (ATI)

- Dr. John Grigsby
  VP Engineering

- Provided “Vector”
  RHAW Systems

- Designated
  APR-25/26
- RHAW Cockpit Display Called “Vector”

- SAM Radar Signal Warning

- “3-Ringer”

- Also …

- “Rattle Snake” Sound In Headset
Dempster Committee
Anti-SAM Systems

- Two-Seat F-100F Selected for Hunter/Killer Platform (Wild Weasel I)

- Four Acft Modified at North American Aviation (NAA) in Long Beach, CA

Used ATI Vector System
Wild Weasel I
Testing at Eglin AFB FL

- Highest Priority of All Testing at Eglin
- Testing Combined With Aircrew Tng
- Two Project Officers – TAC & AFSC

Maj Jim Odem
– Pilot
TAWC TAC

Capt Joe Telford
– EWO
APGC AFSC
Wild Weasel I
Aircrew Test Team

- **Six Pilots & 5 EWOs – All Volunteers**
  
  **Pilots**
  - Capt Al Lamb
  - Capt Maury Fricke
  - Capt Ed White
  - Capt Les Lindenmuth
  - Capt John Pitchford
  - Capt George Kerr

  **EWOs**
  - Capt Ed Sandelius
  - Capt Don Madden
  - Capt Jack Donovan
  - Capt Walt Lifsey
  - Capt Bob Trier

- **Maj Garry Willard – Team Lead**
Wild Weasel I
Test Plan

- Three Objectives:
  - Determine Accuracy of ATI’s RHAW System
  - Determine Crews’ Ability to Locate SA-2 Radar
  - Develop Tactics For Killing SAM Sites

- Deploy to Korat For Combat After Eglin
Eglin Wild Weasel I Tests

- 11 Oct 1965 – Testing Started
- Two F-100Fs Initially
- Early Nov 65 – Two More F-100Fs Arrived From NAA
Sept – Nov 1965
Meanwhile the Air War Continued ...

- ... More Losses to Planes and Pilots

- Some Successful Attacks Against SAM Sites
30 Sept 1965
SAMs Downed Another F-105

- **Target:** Ninh Binh Bridge (JCS 10) 43 NM South of Hanoi

- **Lt Col Melvin J. Killian, 334 TFS Commander, Downed by SAM**

- **Second USAF Squadron Commander Lost to SAMs or Their AAA**

Lt Col Melvin J. Killian - KIA
17 Oct 1965
1st Successful SAM Site Attack

- Navy Attack on SAM Site Near Kep Airfield
- Iron Hand A-6A and A-4Es From Carrier USS Independence Destroyed Missiles, Transporter, & Radar Van

A-6A Intruder

A-4E Skyhawk
31 Oct 1965
Iron Hand Attack

- A Navy A-4E Led F-105s From Takhli in Attacks Against Two SAM Sites
- A-4E Equipped with Melpar APR-23 RHAW
- F-105 Carried More Bombs
- Led by Lt Cmdr Trent Richard Powers From USS Oriskany
  - SAM Sites Destroyed ...
  - ... Lt Cmdr Powers KIA From AAA
31 Oct 1965
Iron Hand Attack

- Powers Posthumously Awarded the Navy Cross

Lt Cmdr Trent Richard Powers - KIA

U.S. Navy Cross
5 Nov 1965

Another Iron Hand Loss

- A-4s With RHAW to Lead F-105s From Korat
- A-4s From *USS Midway* Aborted
- F-105s Pressed On
- Lt Col George C. McCleary – 357 TFS Commander – KIA by a SAM
- Third USAF Squadron Commander Lost to SAMs or Their AAA
6 - 8 Nov 1965
McCleary RESCAP Losses

- Two A-1Es. Both Pilots POWs

- CH-3C 63-09685 “Jolly Green 85”
  - Same Chopper That Rescued Capt Tullo
  - Three Crewmembers POWs, One Rescued

- Searches Called Off After 3 Days & Many Damaged Planes
5 - 8 Nov 1965
SAM Sites Didn’t Always Win

- Air Force and Navy Planes Found & Attacked 4 SAM Sites Over 4 Days

- NVN’s 236th Missile Regiment Out of Action

- Same Unit That Had Downed F-4C on 24 July
Destroyed SAM Radar
Oct - Dec 1965
Anti-SAM Equipment Delivered

- 19 Nov 65 – USAF Ordered 500 Sets of RHAW Systems For F-105s From ATI

- Draft $6.7M Contract Written on Blackboard & Documented by Polaroid Photo

- APR-25/26 Installed at Takhli in Dec 65 ...

... Less Than 3 Months After Dempster Committee Direction
APR-25/26 RHAW System

APR-25 Antenna
F-105D
Nov 1965
F-100F Wild Weasels Deployed

- 19 Nov 65 – Testing at Eglin Completed
- 25 Nov 65 – Four F-100Fs Arrived at Korat
28 Nov 1965
F-100F Wild Weasel Test Team At Korat
Dec 1965

2 Types of Wild Weasel Missions

- Hunter-Killer Missions With F-105 Flights

- Strike-Force-Protection Missions
3 Dec 1965
1st Wild Weasel Hunter-Killer Mission

“Bamboo” Flight With 469 TFS F-105 Pilots
#1 – Maj Bob Krone – 469th Ops Officer
#2 – Capt Jerry Driscoll
#3 – Capt Fred Coleman
#4 – Capt Steve Sanders
F-100F – Maj Garry Willard & EWO Capt Walt Lifsey
F-100F – Capt Les Lindenmuth & EWO Capt Bob Trier

Did Not Detect SAM Site ...

... So Bombed Army Barracks in NVN
20 Dec 1965
First Wild Weasel Combat Loss

- F-100F Wild Weasel Part of Strike Package of 12 F-105s Attacking Kep Airfield
- F-100F “Apple 01” Hit by AAA & Crew Ejected

Pilot Capt John Pitchford – POW

EWO Capt Bob Trier – KIA
22 Dec 1965
First Wild Weasel SAM Site Kill

- SAM Site Near Yen Bai 58 NM NW of Hanoi
- F-100F & Four F-105s From 421 TFS
- “Spruce” Flight:
  #1 – Capt Don Langwell
  #2 – Capt Van Heywood
  #3 – Capt Bob Bush
  #4 – Capt Art Brattkus
  #5 – Capt Al Lamb & EWO Capt Jack Donovan
22 Dec 1965
First Wild Weasel SAM Site Kill

Keith Ferris Painting “First In”
23 Sept 2005
Wild Weasel Reunion

- Keith Ferris Donated Painting to AF Museum

Keith Ferris  Al Lamb  Jack Donovan  Van Heywood
25 Dec 65 – 31 Jan 66
36-Day Bombing Halt Over NVN

- Interrupted SAM-Site Battles
1965 U.S. Anti-SAM Program
Accomplishments

- Fielded RHAW Equip For Fighters
- Developed Flight Tactics For Evading SAMs
- Fielded Improved Shrike Missiles
- Started Stand-Off Jamming (EB-66s)
- Developed Anti-SAM Acft (Wild Weasels)
- Fielded Jamming Pods For Fighters
- All Programs Still Used In Some Form Today
U.S. Anti-SAM Program Results

- Decreased U.S. Acft Losses Per SAM Firings

The End

Momyer
“Airpower in Three Wars”
pg 136