

This information was put together for ----- by the Nation Gulf War Resource Center (NGWRC). WWW.NGWRC.ORG

----- came to the NGWRC and asked for our help in providing information needed for his claim before the Department of Veterans Affairs (VA). He needs proof about given facts from the gulf war. The facts about the scuds targeting the port city of Dhahran are attached to this letter. You will see in the data that we was able to get from the DoD website, much as you could have done, that the was a number of scuds.

It should be noted that on the night of January 17th 1991, when the first Scud was fired, the service members at the port city of Dhahran went into MOPP-4 for six or more hours. It was a known fact that the troops at the port city of Dhahran were warned of the incoming scud by a loudspeaker system.

The troops was at the time, ordered to take their Pyridostigmine Bromide (PB) Pills (anti nerve agent) that had some side effects that made many veterans feel like they was exposed to gas. It should be noted that the port is at Dhahran, the same place as the veteran. This is also the same place that a scud landed and killed 28 reservists on the 25th of February.

As a gulf war veteran and as the operation officer working in the Tactical Operation Center (TOC) of 4th Bn 5th FA, a unit of the 1st ID from Ft. Riley, KS that was in the Dhahran, I can attest to the first scud attacks. The troops deployed to the region were given briefings on how we would come under attack by scuds and that they would most likely have chemical warheads. I was briefed and had to brief that if we were attacked by scuds, we would loss men. I do know that for me and many of my men the PB pills did make us feel sick. Some felt like they were exposed to gas; but our chemical officer told them it was just the side effects of the pill. If ----- took his pills and had the some problems, who know what it would have gone through his mind for year after that.

The load speaker first went off with "Scud launch". This is when we were order into an area and told to take our nerve agent pills and told how some might make it if there was nerve gas and it got on our skin. Then the load speakers kept blearing "Scud attack- MOPP 4" for a long time. After that they went in to MOPP-4 from 1 to 8 hours depending on the flight path and the all clear from the NBC team.

Other facts you should keep in mind while working a PTSD claim on this veteran. While I had some men “freak out” during the scud attack and from the side effects of the PB pills, even the well trained ones. The pills made a lot of troops feel like they were “gassed” and going to become a KIA.

This statement is true to the best of my knowledge.

Sincerely,

The following information comes from the Department of Defense website.

V. IRAQ'S USE OF SCUDS DURING OPERATION DESERT STORM

A. Introduction

Support for this Information Paper came from hundreds of pages of operational and open source evidence, allowing investigators to piece together lists of Iraq's Scud firings (presented below by general target area). Source documents sometimes contained inconsistent information. Even official logs and chronologies frequently recorded disparate detail and third-hand accounts. While a large volume of contemporary 1991 operational reporting has been declassified or released, some of the most reliable sources of information on Scud firings contain sensitive details and remain classified. Investigators considered all available information in constructing summaries for each attack. For completeness, however, our summaries below cite reports with alternative information on numbers of Scuds in an attack, Patriot defensive reactions, ground damage, and other details. For some operational logs and chronologies we uncovered only individual pages detached at some point and set aside because they touched on Scuds. In some cases, we could not identify the originating military organization, but all such evidence came from archives of official documents that the services reviewed for use in this paper.

The brief summaries that follow integrate what we know regarding Scuds fired at targets in the KTO and against Israel. The map in Figure 2 plots generalized launch locations in Iraq, impact areas in the KTO and Israel, and approximate maximum range of Scuds from the launch areas.^[45]



Figure 2. Scud launch areas, target regions, and Al Hussein range

We have converted all times to local date and time in the KTO.^[46]

In the rest of this section we first discuss the total number of Scud missiles fired at Coalition forces and Israel during the Gulf War. Available counts vary. We follow this with separate coverage of the Scud attacks in four geographic regions: the eastern KTO, the Riyadh area, the region of KKMC and Hafir Al Batin, and finally Israel. We summarize in tables the Scud strikes against each KTO region and follow the tables with a few more detailed accounts of the most significant incidents.

B. Total Scud Firing Incidents

At one of our veterans' outreach programs in 1998, a veteran questioned the number of Scud missiles fired against Coalition forces during the Gulf War. He based his opinions on an internal working document produced by the Armed Forces Center for Unit Records Research (CURR) and provided by that Department of Defense organization to some veterans. The listing had 179 incident entries totaling 344 missiles. A junior officer of the Center had compiled a list of Scud launch information from hundreds of operational reports, many with inconsistent data. Not knowing which accounts were correct, this officer included all versions of what happened. CURR designed the list to serve as a reference for responding to veterans' communications regarding Scud incidents at particular times. Our research and analysis confirmed that Iraq fired 46 Scuds into the KTO. The rest of the entries in the CURR list involve duplicate reporting or other incorrect information. We have included the CURR compilation and our analysis of it in Tab D. The operational documents that CURR used as sources for their summary we used in preparing this information paper. Many of these documents were not previously available.

After the Gulf War, various authors and government agencies published assessments of Iraq's Scud attacks including the numbers of missiles fired at Coalition forces and Israel. Pieced together from differing data sets, the totals varied generally within a narrow range. Table 2 summarizes the data from selected authors and organizations. The United States Space Command's count of 97 launches includes nine more than the 88 missiles our investigation determined struck Coalition countries and in or near Israel. Some of the sources cited in Table 2 noted several early in-flight failures that could explain this difference. In reassessing unclassified or declassified material on individual attacks, we can now account for the 46 Scuds that attacked the KTO but only 41 of the 42 Scuds that struck in or near Israel (for a total of 87). However, based on all available information, including classified documents, we are confident that a total of 88 missiles struck in or near the KTO and Israel. In the summaries that follow we break out the 87 firing incidents covered in unclassified or declassified documents by general area attacked (the eastern KTO, Riyadh, KKMC/Hafir Al Batin, and Israel). These incidents are summarized in Figure 3.^[47] After an initial period of intense daily attacks, the number of missiles launched against the Coalition and Israel per day fell off substantially.

Table 2. Number of missiles fired by source

Source	Atk'd KTO	Atk'd Israel	Total Attacks	Remarks

Special Assistant for Gulf War Illnesses ^[48]	46	42	88	Case Narrative ' "Al Jubayl, Saudi Arabia"
Department of Defense Report to Congress ^[49]	N/A	N/A	88	Published in April 1992.
Defense Special Missile and Astronautics Center ^[50]	45	40	85	Disseminated on February 27, 1991, just before the ceasefire.
Iraq, as reported to United Nations Special Commission ^[51]	51	43	93	Further details are not in the public domain, but Iraq's launch information agreed well with other sources (with a few exceptions).
United States Space Command ^[52]	N/A	N/A	97	Based on Defense Support Program infrared satellite data on launches (rather than impacts in target areas).
Center for International Studies ^[53]	42	39	81	Plus 5-8 that failed shortly after launch.
Military Lessons of the Gulf War ^[54]	46	40	86	A book published after the war in 1991.
<i>Jane's Soviet Intelligence Review</i> ^[55]	46	40	86	Plus "five missiles believed to have broken up immediately after launch and did not reach Saudi Arabia or Israel."

Figure 3. Scud attacks by target area

During the war, some intelligence estimates concluded that Iraq fired Al Abbas missiles with an even greater estimated range than the Al Hussein. Authorities later determined that Iraq fired only the Al Hussein extended range missile except for five attacks with the Al Hijarah variant.^[56]

The KKMC/Hafir Al Batin area did not get targeted until the later stages of the Scud attacks. At the end of the war, Iraq fired several Scuds toward Bahrain and Qatar in the eastern KTO (See the regional summaries in Sections C and E below.)

Because many Scuds broke up as they reentered the denser atmosphere, and Patriots intercepted others, some observers might believe a single missile attack included more missiles than was the case. Also, the kinetic energy of heavy debris striking the ground at about 3,600 miles per hour (one mile per second) could cause a significant crater.^[57] Both the heavy warhead and engine sections sometimes separated from either end of the missile body on reentry. In these instances, the large but now significantly lighter missile body could decelerate enough from air resistance to survive impact almost intact, as several did.^[58]

C. Scud Incidents in the Eastern KTO

Below we address Scud attacks in the Eastern KTO. In this section and those that follow, we summarize the nature of attacks in table entries, including the best available information on the number of attacking missiles. We also note alternative missile numbers we determined were inaccurate but that appeared somewhere in operational reporting (alternative reporting or "alt rpts" numbers in the fourth column). We follow the tables with more detailed accounts of a few incidents chosen because of potential veteran interest or operational significance. Often, many unit logs, chronologies, and summaries recorded the same Scud attack. In such cases we cite only representative and substantive samples for practical reasons. However, we reviewed all cited references as different documents often contained additional data that could provide a more complete picture of the incidents.

1. Summary

Evidence indicates that Iraq fired 19 Scuds against the areas of Dhahran, Al Jubayl, Bahrain, and Qatar. Table 3 summarizes the details and describes each event.

Table 3. Scud attacks against Eastern KTO

Event #	Date (1991)	Time (Local)	# Scuds (Best est.)	Impact Area	Remarks (MULTIPLE PAGE TABLE)
1	Jan 20	9:43 PM	2 (alt rpts 3)	Dhahran	Some sources reported three Scuds. Chemical alarms went off, tests were negative. Patriots claimed 2 kills. MOPP Level 4 (see Tab A) was in effect for six to seven hours. Debris and two impacts found. See Details on Selected Incidents below.
2	Jan 21	12:29 AM	2 (alt rpts 3)	Dhahran	Patriots claimed one kill, let other hit water. Debris hit runway at Dhahran International Airport, outside an aircraft bunker, and other areas. ^[59]

3	Jan 21	10:18 PM	1 (alt rpts 2)	Al Jubayl	No Patriot engagement. ^[60] Target may have been Dhahran.
4	Jan 22	7:10 AM	3 (alt rpts 4)	Dhahran	Scuds one and two were not engaged and hit outside of town. Scud three was intercepted by Patriots and landed off Qatar. Debris hit Dhahran area. Most chemical warfare agent tests were negative. See Details on Selected Incidents below.
5	Jan 23	10:54 PM	2 (alt rpts 3-5)	Dhahran	Iraq rapidly fired five Scuds ' one at Israel and two each at Dhahran and Riyadh. Of the two Scuds fired at Dhahran, Patriots intercepted at least one. Debris fell within and just outside United States occupied base. ^[61]
6	Jan 26	3:28 AM	1 (alt rpts 2)	Dhahran	Successful Patriot engagement reported. Debris hit Dhahran International Airport. ^[62]
7	Feb 16	2:01 AM	1	Al Jubayl	Patriot down for maintenance ' no engagement. Scud broke up over harbor and hit the water near ammunition pier. See Details on Selected Incidents below.
8	Feb 22	2:31 AM	3 (alt rpts 1-2)	Bahrain	First time targeted. Patriot battery on Bahrain engaged one Scud and debris was found. Other two Scuds were out of defended area. ^[63]
9	Feb 23	4:59 AM	2 (alt rpts 1, 4)	Dhahran	Scud one had non-threatening trajectory, and Patriots did not engage it. It landed 12 miles north of King Fahd International Airport. Scud two broke up in flight. ^[64]

10	Feb 25	8:32 PM	1 (alt rpts 3)	Dhahran	Of two Patriot batteries in range, one was non-operational and other did not detect Scud because of software problem. Warhead hit United States barracks killing 28 and injuring over 100. See Details on Selected Incidents below.
11	Feb 26	1:26 AM	1 (alt rpts 3)	Qatar	Scud overflow Dhahran headed for Qatar. No Patriot engaged because it was out of defense zone. Scud fell into Gulf 40 miles off Doha, Qatar. ^[65]

2. Details on Selected Incidents

a. January 20th Attack on Dhahran (Event 1 in Table 3)

Shortly before 10 PM on January 20th, Iraq fired the first two Scuds at the Dhahran area.^[66] One report noted that Patriot units fired five missiles at three (rather than the actual two) Scuds and that M8 chemical agent alarms went off, but subsequent tests proved negative.^[67] A separate United States Air Force unit at Dhahran logged an entry at 9:50 PM noting multiple explosions. Checks revealed that none of that unit's chemical agent detectors had alarmed. A later entry reported a possible impact near a barracks and the United States Army Component United States Central Command headquarters as well as near a Saudi police camp and the port area. Subsequent investigation turned up no building damage, casualties, or unexploded ordnance.^[68] A witness to the January 20th attack remembered that a Patriot battery took out the Scuds near a pier in Dhahran and that everybody went to MOPP Level 4 (full chemical protection ' see glossary at Tab A) for about six or seven hours while tests and assessments were made. He did not know the test results, but an "all clear" was sounded permitting a termination of the chemical alert.^[69] A chemical company soldier remembered witnessing repeated M8A1 chemical agent alarms and positive M256 chemical detection kit tests the first night of Scud attacks in the Dhahran area and recalls remaining in MOPP Level 4 for seven hours. He believed no one had chemical agent symptoms.^[70]

b. January 22nd Attack on Dhahran (Event 4 in Table 3)

Shortly after 7:00 AM on January 22nd, Iraq fired three Scuds toward Dhahran. The first two flew outside of the Patriots' defended area with at least one landing in the desert about 50 miles west of town. The other reportedly went down in Gulf waters north of Qatar. Most unclassified sources credit Patriots with intercepting the third Scud.^[71] Debris reportedly struck on a Dhahran Air Base runway just as an aircraft took off to the south, but the aircraft apparently escaped damage.^[72] Most pieces of debris were described as small (less than 3 inches), but something falling out of the sky caused a crater 23 feet in diameter and 4 feet deep on the air base. All but one field test indicated no presence of chemical

warfare agent. In that one positive chemical warfare agent test, a chemical agent monitor registered a very low concentration on the nerve agent scale. Subsequent testing at that location proved negative.^[73] A Fox chemical reconnaissance vehicle (see glossary at Tab A) took samples from the crater area for additional testing, but we found no specific results of any Fox tests.

Alternative reporting included a fourth Scud that appeared in some chronologies at this time as a target for two Patriot launches. However, this track represented a false target (radar interference ' see Section VI.B). One summary suggested that Patriot units fired two missiles at each of three Scuds.^[74]

c. February 16th Attack on Al Jubayl (Event 7 in Table 3)

Iraq fired a single Scud at the port city of Al Jubayl early on February 16th.^[75] The Patriot battery positioned to defend Al Jubayl was undergoing maintenance at the time and could not engage the Scud.^[76] The incoming missile broke up in flight over the harbor and hit in the water just off a large pier where six ships and two smaller craft were tied up. The missile's impact also was about 500 feet from ammunition storage on the pier.^[77] Figure 4 displays a map of the harbor showing the impact location.



Figure 4. Map of Jubayl harbor Scud impact

One witness recalls hearing a loud explosion and seeing white-hot objects falling.^[78] The Scud caused no casualties or damage, but it exuded a blue, green, and yellow substance and bubbled a strong-smelling gas for some time (probably inhibited red fuming nitric acid ' see Section VII). United States Navy explosive ordnance disposal specialists eventually recovered the missile in parts using divers, flotation bags, and a crane. Test results performed on this Scud determined that it did not have a chemical or biological warhead.^[79] Figure 5 shows the recovered high explosive warhead.^[80]



Figure 5. Recovered Scud warhead

d. February 25th Attack on Dhahran (Event 10 in Table 3)

Iraq launched one Scud toward Dhahran early in the evening of February 25th. One Patriot battery on Dhahran airfield was not operational and another nearby did not track the Scud, apparently because of a software problem.^[81] The Scud broke up on reentry showering a United States housing compound with debris, and the warhead hit a warehouse serving as a United States barracks in Aujan compound in the Dhahran suburb of Al Khobar. The strong explosion and resulting fire killed 28 United States soldiers from the 475th Quartermaster Group (a United States Army Reserve unit) and injured 100, about half of them seriously. According to one source, most of the injured suffered burns. Initially, some 40 soldiers were believed missing.^[82] Most of the soldiers in the warehouse had just arrived and had not completely processed into their units. This, plus the presence of their personnel files and computer records in the same devastated warehouse, played havoc with the ability to account for people.^[83] Helicopters eventually evacuated 70 to 100 soldiers to six hospitals including five Saudi facilities.^[84] This single incident caused more combat casualties than any other in Operation Desert Storm.^[85]

Some documentation includes alternative details to this horrific event. One message stated that this incident involved three confirmed launches (one against Dhahran, one against nearby King Fahd Airport and one against Qatar).^[86] A press briefing attributed the lack of Patriot engagement to a combination of the warehouse location (housing) and debris trajectory from a disintegrating Scud.^[87] The media quoted another senior officer as explaining that "because it [the Scud] had gone into a tumble ' it wasn't within the parameters of where it would be attacked by our missile defense system."^[88]

D. Scud Incidents in the Riyadh Area

1. Summary

Investigators counted 18 Scuds fired against the area of Riyadh during Iraq's missile attacks. Table 4 and the details on selected incidents that follow address these attacks.

One log contained plots of five impacts for these attacks, but did not indicate which involved warheads (and hence separate missiles) and which might have resulted from debris. Three impacts happened close to the town and two at some distance to the south and to the east. The log suggested that the additional impacts resulted from one Scud breaking up in flight.^[117] Other reports noted that local eyewitnesses claimed a Scud broke up after another Scud missile or a Patriot hit it.^[118] An official United States Air Force post-war assessment noted five Scud launches on the 14th.^[119] Another Scud-tracking organization listed four launches on February 14th. Scuds struck no other target area on this date.^[120] A nuclear-biological-chemical operations summary stated that one Scud in this attack had an airburst suspected of involving a chemical agent warhead. Units did both ground and aerial surveys. Reports did not indicate how the air survey was conducted, but part of the ground survey included use of a Fox chemical reconnaissance vehicle. The report noted that no contamination was found and that the air burst really involved the Scud breaking up in flight.^[121]

Other reporting typifies the variety of accounts that surrounded Scud attacks. From reports that all of the impacts occurred in unoccupied desert areas (but there were casualties and damage in town) to accounts that witnesses saw three air bursts near the town with a warhead separating from one of the missiles (the only report noting three air bursts),^[122] unclassified documentation clearly does not present

a consistent picture regarding how many missiles were involved in this attack. Based on all available evidence, however, we assess that five separate Scuds struck in the area.

b. February 21st Attack on KKMC (Event 25 in Table 5)

Iraq launched this attack from the Baghdad area toward KKMC at about 9:00 PM.^[123] Missile impact was expected about 12 miles north of the city.^[124] However, the missile disintegrated prior to impact, and witnesses observed an air burst. All but two reports indicated Patriots defending the KKMC area did not attempt to engage the Scud.^[125] Research revealed no indications of casualties or damage, but one source reported that debris fell in Trailer City, a temporary United States housing area. A United States airman in the housing area remembered the debris falling around him but recalled no injuries.^[126]

VI. FALSE ALARMS AND FALSE TARGETS

Coalition forces in the Kuwait theater of operations responded not only to actual Scud launches but also to many false reports of Scud attacks generated by early warning surveillance assets, intelligence reports, or because Patriots fired at false targets.

A. False Alarms

After a thorough review of ballistic missile incident accounts from Operation Desert Storm, we determined that at least 60 false alarms were logged in the KTO^[131] (in addition to the Patriot false target detections addressed separately below). None of these 60 alarms documented an actual missile attack, but they may have created the impression that such attacks occurred more frequently than was the case. Even though many of these alerts were cancelled within minutes, many servicemembers and civilians took appropriate measures, donned chemical protective gear, and sought shelter. We believe (because alerts were canceled promptly) that misinterpretation of initial infrared (heat-source) detections by satellites led to most of these false alarms. At least two other false alarms came from detection of signals from a radar associated with Scud operations (it tracks weather balloons to determine winds aloft).

The United States operations, intelligence, and space communities collectively made history when they developed a system to provide warning of Iraq's ballistic missile launches to the entire KTO (and Israel) within minutes.^[132] This system relied primarily on space-based infrared surveillance. However, across any combat theater, there are many non-missile infrared sources including exploding bombs, high intensity flares, demolitions of weapons storage sites, and other sudden heat-producing events capable of registering on infrared-sensitive devices. Because warning time was at a premium, some early alerts proved false, but the goal was always to notify quickly to protect lives.^[133]

On January 17th, the day the air campaign began, a Scud warning shortly after 4:00 AM put many bases and units in the Dhahran area into MOPP Level 3 (full protective gear except gloves ' see glossary in Tab A).^[134] Reports even noted confirmed missile impacts in the area^[135] and Scud fragments collected.^[136] The warning was eventually cancelled.^[137]

A mobile Army surgical hospital (MASH) chronology includes the following for January 17th:

The 807th MASH has entered the war, and suddenly loudspeakers begin to blare, "SCUD alert ' MOPP level four" ' we all scurry into our MOPP gear ' The lights are out, now, and we have been previously informed that the Saudis think a SCUD can only penetrate the top two floors of our building. In total darkness, punctuated only by the red-lensed flashlight beams, all 250 members of the 807th troop down three flights of stairs. As we occupy the empty apartments, each person sits on the floor, alone inside his mask except for his or her thoughts and fears. For 2 long hours we breathe claustrophobic air in hot chemical suits, until, with dawn, we hear, "ALL CLEAR, MOPP level zero." ' We later find out that radar confused our own returning B-52's with Scuds. Fortunately, we learn that after the war has ended.^[138]

Figure 7 summarizes the false alarms during Operation Desert Storm. These false alarms declined in frequency after the first eight days of the war. The decline possibly reflected refined human judgment or adjustments in procedures. In addition to the detections graphed, United States Space Command generated five false alarms from December 25-30, 1990, three the result of live ballistic missile test firings by Iraq.^[139]

Figure 7. False alarms during Operation Desert Storm

B. Patriot False Target Detections

According to information published after the Gulf War, a problem with the Patriot radar system caused Patriot missiles to fire at phantom targets. In September 1992, an Army official admitted that electronic signals, or noise, emitted by a variety of United States systems caused computer problems and accidentally launched Patriot missiles in the first week of the war. The Patriot's radar system processed these signals as the result of software flaws and a design that left the back of the radar unit open to stray signals. These signals came from the airborne warning and control system aircraft, radar jamming pods on fighters, test equipment, airport radars, and communications systems. Software changes and makeshift shrouds for the backs of Patriot radars eventually resolved the problem.^[140] During the early stages of the air war that began on January 17, computers automatically directed the Patriot missile batteries' threat responses. Soldiers in Patriot units did not have a role in the fire, no-fire decisions. Patriot units later revised the procedures, and changed to a manual mode of engagement that allowed operators to decide when to fire.^[141]

The first actual ballistic missile attack against the KTO occurred against the Dhahran area at 9:43 PM on January 20, 1991. However, false targets involving Patriot reactions began on January 18, 1991, without warnings from national surveillance assets. Veterans aware of these engagements believed, at least at the time, that incoming missiles threatened them. Most reports did not identify the January 18th incidents as reactions to Patriot false targets until after the war when the discrepancy became public knowledge. For example, during the war, one Army document noted for the 18th that Patriots intercepted a single Scud in the Dhahran area.^[142] Alpha Battery, 2nd Battalion, 7th Air Defense Artillery got credit for a first successful Scud intercept. An element of the XVIII Airborne Corps reported seeing a Scud missile heading south. Three powerful explosions occurred over Dhahran Air Base. This report claimed that three missiles had been fired at Dhahran. The same document indicated that Patriots engaged one incoming missile but that another hit Khobar, an area where United States forces were

billeted. The entire Dhahran area was reported at MOPP Level four with lower MOPP levels ordered further west.^[143] A Fox chemical reconnaissance vehicle searched for evidence of chemical warfare agent but found none.^[144] One chronology stated that the explosions happened when a friendly aircraft released bombs into an ordnance jettison area.^[145] We found only one contemporaneous record that indicated (correctly) that the reports of ballistic missiles launched at Dhahran on the 18th were erroneous.^[146]

Despite the flurry of Patriot false targets early in the war (some interspersed with real attacks), we found no evidence that Patriots engaged false targets after January 23, 1991 (presumably because of the equipment and software fixes). Figure 8 shows how the 20 false target detections break down by day based on research of unclassified and declassified operational reporting.^[147] Patriots did not launch missiles at every false target, but one report indicated that Patriot batteries fired a total of 22 missiles at false targets. In another report, an official admitted that the number was 24.^[148]