



REPORT ON OBSERVED HEALTH EFFECTS
OF RESIDENTS OF NAVAL AIR FACILITY ATSUGI
RELATED TO JINKANPO INCINERATOR EMISSIONS

OPTIONAL FORM 99 (7-90)

would like to discuss w/ rjw

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This report was a part of 39 pages fax I sent you this morning, but it got changed by (b) (3) this afternoon and also he added some new charts.

JULY 1997

Health Effects Analysis
Performed and Prepared by:

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1. Reference:

- (a) Air Quality and Impact Study and Human Health Preliminary Risk Evaluation of Jinkanpo Incinerator Complex Activities on Naval Air Facility Atsugi, Japan of 6 October 1995
- (b) Occupational Health Edited by Levy and Wegman, Little, Brown and Company
- (c) Industrial Toxicology Edited by Williams and Hurson, Van Nostrand Reinhold
- (d) Officer in Charge, Navy Environmental and Preventive Medicine Unit Six letter, Serial # EP20/0516 dated 8 September 1995
- (e) Phone conversation between (b) (3) (NAF Atsugi) and (b) (3) (NEPMU-6) of 25 July 1997
- (f) NIOSH Pocket Guide to Chemical Hazards - 1994 Edition

2. Reference (a) has documented the exposure of NAF Atsugi residents to toxic contaminants from Jinkanpo incinerator complex and identified possible future cancer risks from exposure to these chemicals. The purpose of this report is to discuss currently observed acute health effects that NAF Atsugi residents are experiencing. These effects are also documented among the Japanese Master Labor Contract workers on NAF Atsugi, and Ayase Industrial Complex employees in the attached testimonials. These effects can also be expected to impact the Japanese Maritime Self-Defense Force personnel on NAF Atsugi and residents of Fukaya neighborhood in Ayase-shi.

3. This report was researched and prepared during the month of July by NAF Atsugi, with the assistance of US Naval Hospital Yokosuka, Branch Medical Clinic Atsugi, and Navy Environmental Preventive Medicine Unit Six (located in Hawaii). Medical data was obtained from Branch Medical Clinic Atsugi and US Naval Hospital Yokosuka. Testimonials were submitted to NAF Atsugi by concerned residents and Japanese nationals. These testimonials were submitted in response to a request for information on physical effects suffered upon exposure to Jinkanpo incinerator emissions. It is an important point to note that more Japanese submitted testimonials than US citizens.

4. The medical data was obtained from logs and a computer system not specifically designed for research purposes. This made the research difficult to complete, but accurate and verifiable. Testimonials are done on a strictly voluntary basis so that scientific comparisons cannot be performed. Still, the information is relevant and compelling. There were many other studies that could not be performed due to the previous method of maintaining medical records. This situation has changed drastically since the installation of the Ambulatory Data System (ADS) installed at Branch Medical Clinic Atsugi during the month of July 1997. This system was designed to facilitate research into any deviation in disease rates and will allow the careful tracking and retrieval of any listed medical condition. Any of the medical conditions listed in this report can now be tracked and compared to rates at other US military facilities in Japan and the United States. The rest of this report discusses the documented health effects experienced by residents of NAF Atsugi, with all 355 testimonials (Japanese and American) included as an attachment.

5. There is significant concern among residents of NAF Atsugi that pregnancies are being affected by the incinerator emissions. Difficulties in conceiving, miscarriages (spontaneous abortions), and other adverse outcomes have been mentioned by residents and medical staff. People who are exposed to something that they perceive to be harmful often associate adverse outcomes to that "thing" (i.e., the incinerator) as the cause. Lead is an air pollutant that has been measured at high levels on base. References (b) and (c) mention lead as a cause of spontaneous abortion. A review was therefore conducted of the spontaneous abortion (SAb) rate at NAF Atsugi to determine if there is an identifiable increase in the SAb rate aboard NAF Atsugi. The spontaneous abortion (SAb) rate for Navy personnel and dependents located in the Kanto plain area as calculated by reference (d) is approximately 12%. A review of pregnancies (as identified by a positive hCG test at Branch Medical Clinic Atsugi) was done for the time period June 1996 through June 1997. For all pregnancies identified at Branch Medical Clinic Atsugi during this period, the SAb rate was 13.6%, which is slightly higher than the rate noted in reference (d). Next, the NAF Atsugi pregnancies for June 1996 through June 1997 were divided into those living on base and those living off base (according to NAF Atsugi housing records). The off base rate was then compared to the on base rate. The off base rate was 12.2%, which is essentially identical to the rate quoted in reference (d), while the on

base rate was 15.4%. This results in a relative risk of 1.26 (26%) higher rate on base versus off base. The chi-square test for statistical significance was $p = 0.535$, with a confidence interval of (0.554 - 3.115). As discussed during reference (e), this data agrees with the belief that the incinerator affects pregnancies, but due to the low numbers of pregnancies reviewed (176) it does not prove that the on base SAB rate is higher than the off base rate. The Navy is concerned with these results and will continue to follow the SAB rate at NAF Atsugi very closely to determine if this difference in rates continues.

6. The immediate negative impact on people's lungs from the incinerator emissions is another area of concern. References (b), (c), and (f) list bronchospasm, a key component in asthmatic attacks, as a health effect for one or more of the elevated emissions from Jinkanpo incinerator. To measure the incinerator's impact on NAF Atsugi, a case series study of asthma patients was conducted using pharmacy records at Branch Medical Clinic Atsugi. Asthmatics who lived off base and then moved on base were tracked to find out if the on base air pollution caused them more distress than the off base air pollution. To ensure adequate records both before and after people moved on base, only those moving on base from May 1996 to February 1997 were considered. All of these people spent at least as much time off base as on base, so these numbers should be comparable if the incinerator were not affecting people's health. The effects after moving on base for the 12 people with full blown asthma (as measured by either the use of a nebulizer machine or the use of steroids with an inhaler) are dramatic. Three people used nebulizers before moving on base, for a total of 5 prescriptions. Five people have needed nebulizers after moving on base, for a total of 13 prescriptions, a three-fold increase in nebulizer prescriptions. Steroids are used by people whose asthma has been aggravated by something in the air. Of the asthmatics who moved on base from May 1996 to February 1997, only two used steroids before moving on base, for a total of 3 prescriptions. After moving on base, 10 of these asthmatics have gone on steroid treatment, for a total of 13 prescriptions. This is a five-fold increase in the number of people needing steroids, with a four-fold increase in the number of prescriptions provided. These same 12 asthmatics had received 30 inhalers before moving on base and have received 67 inhalers after moving on base, more than doubling the number of inhalers utilized. An additional 15 people have either gotten their first inhaler or have received more inhaler prescriptions after moving on base. Although asthma patients are the people most likely to exhibit the effects of poor air quality, all residents and many Japanese workers are receiving the same exposure.

7. Upper respiratory infection (URI) can be used in addition to asthma for measuring the negative impact on people's lungs. Reference (c) specifically mentions upper airway secondary infections for hydrochloric acid, sulfur dioxide and nitrogen oxides, three of the compounds measured at elevated levels during 1995 and/or 1997. A study was done by US Naval Hospital Yokosuka in 1996 comparing URI related complaints at USNH Yokosuka to Branch Medical Clinic Atsugi for 1995. The study showed that URI related complaints were 30% higher at Atsugi compared to Yokosuka. This medical effect was also listed on 19 of the 150 US testimonials.

8. Skin rashes are another concern for people living on base. References (b), (c), and (f) list skin rashes for many of the elevated pollutants coming from Jinkanpo incinerator complex. It was also listed on seven of the 150 US testimonials.

9. There are several other health effects listed in references (b), (c), and (f) for the 13 pollutants measured at elevated levels on NAF Atsugi. These health effects include headaches, eye irritation, nausea, breathing difficulties and/or chest pain, coughing, and fatigue. As would be expected, several of these health effects were mentioned on a large number of the testimonials submitted in February 1997. This includes headaches on 91 of 150 testimonials, eye irritation on 70 of 150 testimonials, nausea on 48 of 150 testimonials, breathing difficulties and/or chest pain on 44 of 150 testimonials, excessive coughing on 23 of 150 testimonials, and fatigue on 6 testimonials. The new Ambulatory Data System mentioned above will allow NAF Atsugi and Branch Medical Clinic Atsugi to track and quantify some of these health effects and compare them to other medical facilities around Japan.

10. Reference (I), current sampling, and much of the above information indirectly links Jinkanpo incinerator complex with the observed negative health effects on NAF Atsugi. This information cannot directly link Jinkanpo emissions with observed health effects due to the previous medical records system and the way sampling has been performed. Continuous and spot sampling are currently being conducted on NAF Atsugi, with plans for a permanent, computer integrated, continuous monitoring station in the design stage. This permanent monitoring station, in conjunction with the Ambulatory Data System recently installed at Branch Medical Clinic Atsugi, will allow NAF Atsugi to directly compare elevated emissions with hospital visits and diagnoses that are associated with these emissions. It will greatly reduce any uncertainty about whether these emissions are directly causing the observed health effects. Also, since the data from both systems are collected and stored in computers, the data will be available from the time the system is placed in service forward, with no loss of data when people leave the area. This will provide a tremendous improvement in any future reports on this subject.

11. As stated previously, NAF Atsugi, US Naval Forces Japan, and US Forces Japan are all extremely concerned with health effects to US citizens and will continue to track this issue closely.

Attachments:

- 176 owners and employees of Ayase Industrial Complex
- 29 Japanese Master Labor Contract employees of NAF Atsugi
- 150 American residents and employees of NAF Atsugi

Data from Health Effects Study:

A. SAb data:

Month	On base		Off base	
	+hCG	SAb	+hCG	SAb
Jun 96	7	1	1	0
Jul 96	4	1	9	0
Aug 96	8	0	15	0
Scp 96	5	0	5	2
Oct 96	7	1	5	0
Nov 96	3	0	7	0
Dec 96	5	1	8	0
Jan 97	7	2	13	4
Feb 97	5	1	12	3
Mar 97	11	1	3	0
Apr 97	7	2	11	2
May 97	5	1	3	0
Jun 97	4	1	6	0
Totals	78	12	98	12

	Observed		Expected	
	Yes	No	Yes	No
On base	12	66 = 78	10.6	67.4 = 78
Off base	12	86 = 98	13.4	84.6 = 98
Totals	24	152 = 176	24	152 = 176

B. Asthma data:

Patient #	Medication before	Date moved on base	Medication after
1	Inhaler - Jan, Apr, Jun, Jul 96	8 July 1996	Nebulizer - Jul, Dec 96, Mar 97 Steroids - Mar 97 Inhaler - Aug, Sep, Oct, Nov 96, Dec 96 (2), Jan (2), Feb (2), Mar (2), Apr (2), May (2), Jun (2) 97
2		2 Oct 1996	Nebulizer - Mar 97
3	Nebulizer - Jan 96 Oral Steroids - Jan 96 Steroids - Oct 95, Jan 96 Inhaler - Oct 95	26 Jun 1996	Oral Steroids - Oct, Dec 96 Steroids - Sep 96 Inhaler - Dec 96
4	Nebulizer - Mar, May 96 Steroids - Nov 95, Mar 96 Inhaler - Mar (2), Apr, May Jun 96	27 Jun 1996	Nebulizer - Jul, Aug, Sep (2), Nov (2) 96, Jan, Mar 97 Steroids - Sep (2), Oct 96 Inhaler - Jul, Sep (2), Oct, Nov (2), Dec 96, Jan, Mar, May, Jun 97
5	Nebulizer - Dec 95, Apr 96 Inhaler - Aug, Sep, Oct, Dec 95, May 96	17 Jun 1996	Steroids - Nov 96 Inhaler - Jul, Aug, Oct 96, Jan 97, Jun 97 (2)
6	Inhaler - Aug (2), Dec (3) 95, Feb (2), May (2) 96	17 Jun 1996	Nebulizer - Jun, Jul 97 Steroids - Sep 96, Jun 97 Inhaler - Jul (2), Sep (2), Nov (2) 96, Jan (2), Mar (2), May, Jun 97
7		17 Jun 1996	Nebulizer - Nov 96 Steroids - Nov 96 Inhaler - Oct 96, Jan, Mar, Jan, Jul 97
8		17 Dec 1996	Steroids - Mar 97 Inhaler - Mar, May 97
9	Inhaler - Jul 95	22 Jun 1996	Steroids - Jul 96 Inhaler - Jul 96
10	Inhaler - Dec 95, Feb, Apr, Jul 96	5 Aug 1996	Steroids - Dec 96 Inhaler - Dec 96, Feb, Apr, Jun 97
11	Steroids - Oct 96 Inhaler - Apr, Jun, Aug, Oct 96	21 Nov 1996	
12	Inhaler - Mar, Jul 96	14 Aug 1996	Steroids - May 97 Inhaler - Dec 96, Jan, Feb, Apr, May (2), Jun 97

POTENTIAL INCINERATOR-RELATED ACUTE HEALTH EFFECTS OBSERVED AT NAF ATSUGI

Pollutant (1)	Spontaneous Abortion (2)	Asthma (3)	Upper Respiratory Infections (4)	Skin Rashes (5)	Difficult Breathing & Chest Pain (6)	Headache (7)	Eye Irritation (8)	Nausea (9)	Fatigue (10)	Cough (11)
Arsenic				X	X			X		X
Cadmium		X			X	X		X		X
Chromium				X	X		X			X
Lead	X						X		X	
Mercury		X		X	X	X	X		X	X
Nickel				X	X	X		X	X	X
Benzene				X	X	X	X	X	X	X
Carbon Tetrachloride				X				X	X	
Total TCDD (Dioxins)				X						
Hydrochloric Acid		X	X		X		X			X
Sulfur Dioxide		X	X		X		X			X
Nitrogen Oxides		X	X		X		X			X
Particulate Matter - 10 u					X					X

(1) NAF Atsugi Air Quality Report of October 95 listed these pollutants emitted by Jimkanpo Company as exceeding US health guidelines except lead which Kanagawa Prefecture measured exceeding the Japanese standard in February 96. Chart identifies physiological impacts associated with exposure to listed pollutant.

(2) Women who lived on-base between June 96-June 97 and used NAF Atsugi Medical Clinic experienced a 2.7% higher rate of spontaneous abortions than those off-base.

(3) Pharmaceutical records at NAF Atsugi Medical Clinic show a 2 to 4 fold increase in medication for asthmatics who moved on-base between May 1996 and February 1997.

(4) Comparing 1994 Sick-Call Logs showed that NAF Atsugi Medical Clinic had a 30% greater rate of upper respiratory complaints than Naval Hospital Yokosuka, and a 240% greater rate for October through December 94. Also, long lasting or frequent upper respiratory infection appeared in 19 of 150 American testimonials submitted February 97.

(5) Skin rashes appeared in 7 of 150 American testimonials.

(6) Breathing problems and burning or painful chest appeared in 44 of 150 American testimonials.

(7) Headaches, especially constant or severe headaches after moving on base, appeared in 91 of 150 American testimonials.

(8) Eye irritation appeared in 70 of 150 American testimonials.

(9) Nausea appeared in 48 of 150 American testimonials.

(10) Fatigue for which respondents could not identify any other reason appeared in 6 of 150 American testimonials.

(11) Persistent coughing, particularly from non-smokers who developed "smokers cough" after moving on-base, appeared in 23 of 150 American testimonials.



Table 1 Pollutants of Concern that Exceed EPA Risk Based Concentrations (RBCs)

Constituent	Maximum Concentration	EPA Region III RBC
Metals (ug/m3)		
Particulates (PM10)	245	150
Arsenic	0.055	0.00041
Beryllium	0.0012	0.0002
Cadmium	0.343	0.00099
Chromium	0.24	0.0021
Lead	16.3	1.5
Dioxins (pg/m3)		
Dioxin	25.3	0.04
Volatile Organic Compounds (ug/m3)		
Benzene	6.87	0.22
Carbon Tetrachloride	1.15	0.12
Chloroform	0.8	0.077
Chloromethane	3.56	1
Methylene Chloride	24.9	3.8
1,1,2,2-Tetrachloroethane	4.2	0.031
Tetrachloroethylene	10.6	3.1
Trichloroethylene	3.83	1
Hexachloro-1,3 butadiene	11.3	0.08
1,3 Butadiene	1.31	0.0035
Acetonitrile	716	51
1,4-Dioxane	10.2	0.57
Acrylonitrile	2.26	0.026
1,2-Dibromoethane	0.23	0.0082
Vinyl Chloride	0.65	0.021
1,1-Dichloroethylene	0.24	0.036
1,1,2-Trichloroethane	0.67	0.11
1,2-Dichloroethane	0.5	0.069
1,2-Dichloropropane	0.75	0.092
Aldehydes (ug/m3)		
Acetaldehyde	18	0.81
Formaldehyde	22.9	0.14
Crotonaldehyde	3.43	0.0033
Acrolein	1.46	0.021
Pesticides (ng/m3)		
Gamma-Chlordane	1.62	0.018
Alpha-Chlordane	2.91	0.018
Dieldrin	0.69	0.39
Alpha-BHC	1.44	0.99
Aldrin	1.49	0.37
Semi-Volatile Organic Compounds (ug/m3)		
Naphthalene	0.832	0.37
Acetophenone	0.938	0.021
Hexachlorobenzene	0.005	0.0039
1,4-Dichlorobenzene	4.21	0.28