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3
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5 Ruth Medina, Flight Attendant, Northwest Airlines

6 BEFORE THE WORKERS' COMPENSATION APPEALS BOARD
7 STATE OF CALIFORNIA

8
9 RUTH MEDINA,) WCAB Case No.: XXX
10 Plaintiff,)
11 vs.) SSN: XXX
12) **APPLICANT'S TRIAL BRIEF**
13 NORTHWEST AIRLINES and LIBERTY)
14 MUTUAL FIRE INSURANCE COMPANY,) Trial Date: September 14, 2005
15 Defendant) Time: 8:30 am
Judge: Honorable Lawrence Newman

16 COMES NOW, Applicant, Ms. Ruth Medina, with this her Trial Brief after the hearing on
17 September 14, 2005 and alleges as follows:
18

19 **ISSUES BRIEFED**

- 20
- 21 1. Injury AOE/COE to Applicant's upper respiratory system, head, immune system, and
22 neurological system as a result of industrial exposure to toxins.
 - 23 2. Nature and extent of permanent disability.
- 24

25 **STATEMENT OF FACTS**

26 Applicant, Ruth Medina, filed an Application for Adjudication of Claim, alleging injury to her
27 upper respiratory system, head, neurological system, and psyche while employed as a flight
28 attendant for Northwest Airlines on two flights: outbound Flight #27 from San Francisco to
29 Narita, Japan on December 11, 2000; and return Flight #28 from Narita to San Francisco on
30 December 13, 2000. Both flights were on a 747-200 aircraft operated by Northwest Airlines

1 (NWA), aircraft #6635. NWA has since only recognized her psychiatric injury, essentially as a
2 reaction to the stress of what happened during those two flights.

3
4 After the flight attendants boarded the aircraft in San Francisco on 11 December 2000, the lead
5 mechanic (Mr. Bill XX) boarded and told the lead flight attendant (Ms. Georgia XX) that the
6 crew and passengers on the inbound flight had complained about poor air quality and had
7 reported symptoms during the flight. The illness reported on that inbound flight from Narita is
8 recorded in the maintenance logbook (Exhibit 14). The mechanic told the flight attendant that the
9 aircraft's ozone converters had failed. In fact, the converters had failed after 7403, 4907, and
10 7452 hours, respectively (Exhibit 14), far short of the 10,000-hour minimum service life
11 anticipated by Boeing and described by Mr. Greg XX in his January 21, 2005 deposition (p.9,
12 Line 24 to p.10, Line 4). The mechanic told the flight attendant that the converters would not be
13 replaced until later that night in Seoul, Korea, and he recommended that the flight attendants
14 drink plenty of water during their flight. This conversation is described in Ms. Georgia XX
15 deposition, taken January 21, 2005.

16
17 About four hours into that 11-hour flight from San Francisco to Narita on December 11, 2000,
18 the flight attendants started to experience dry burning eyes, bad headaches, and nausea. An
19 unusual number of passengers were also complaining of nausea, vomiting, and headaches. The
20 symptoms were documented in an incident report written by the lead flight attendant and
21 submitted to NWA upon her return to San Francisco two days later (Exhibit 11). During that
22 flight, the Applicant recalls that she had felt well enough to complete her duties, but had felt
23 unusually fatigued upon arrival. That night, aircraft #6635 flew from Narita to Seoul, Korea with
24 a different crew. On the night of December 12, 2000, all three ozone converters were replaced in
25 Seoul (Exhibit 14) with FAA-certified parts from Limco Airepair Inc. (Exhibit 16).

26
27 On December 13, 2000, aircraft #6635 flew from Seoul back to Narita where the Applicant and
28 the same lead flight attendant boarded the aircraft. During her January 21, 2005 deposition, the
29 lead flight attendant described how she had made a point of confirming that the aircraft had been
30 fixed before agreeing to take the flight. The second officer had told her that all three converters

1 had been replaced the night before in Seoul. During the September 14, 2005 hearing, the lead
2 flight attendant reported that she did not know that the reason for the converter failures had not
3 been addressed, and assumed it would be safe for the crew and passengers to return to San
4 Francisco on that aircraft.

5
6 During that December 13, 2000 flight from Narita to San Francisco, the flight attendants and
7 passengers again reported symptoms. During her deposition, the lead flight attendant described
8 "a lot of people throwing up." All of the flight attendants were reporting bad headaches, nausea,
9 and very dry eyes. The lead flight attendant wrote two incident reports to NWA: the first was
10 specific to a passenger who had fainted (Exhibit 12) and the second described how all of the
11 flight attendants and many of the passengers were sick. All of the flight attendants signed the
12 second report. The lead flight attendant submitted both incident reports from this flight to the
13 NWA Inflight Department in San Francisco. Although these two incident reports were submitted
14 at the same time, the company claims to have never received the report that all of the flight
15 attendants had signed.

16
17 Upon arrival in San Francisco on December 13, 2000, the Applicant had eye irritation, chest
18 tightness, and chest pain, consistent with exposure to ozone gas. She also had nausea, headache,
19 and fatigue consistent with the initial effects of exposure to components of aerosolized Exxon
20 2380, the engine oil that NWA was using on its 747-200 aircraft. Exxon 2380 contains a family
21 of neurotoxic chemicals called tricresylphosphates (TCP), and upon heating, carbon monoxide
22 can be generated.

23
24 The mechanical records for aircraft #6635 confirm that all three converters had *again* failed
25 prematurely, this time after only nine hours and 33 minutes of flight (Exhibit 17), far short of the
26 10,000-hour anticipated service life. This time, NWA cancelled the outbound flight to Narita and
27 replaced the ozone converters with borrowed parts, again FAA-certified by Limco Airepair Inc.
28 There is no indication in the mechanical records that NWA investigated the cause of the failures,
29 but presumably by then, the bulk of the oil residue in the ductwork upstream of the converters
30 had aerosolized from the heat in the ducting and/or sloughed off by the high velocity air that was

1 passing through. That second set of replacement ozone converters did not fail within the 60 days
2 following the incident, according to the mechanical records that NWA eventually produced.

3
4 On December 13, 2000 in San Francisco upon arrival from Narita, the Applicant immediately
5 reported to the airport clinic. Dr. Anna McHargue, a physician employed at the airport clinic for
6 airline workers that is funded by the airlines, documented that the Applicant had "inflamed and
7 swollen nasal mucosa, wheezing, and chest pain." She also noted that the Applicant had been
8 "exposed to/from Japan to poor air quality due to plane [sic] mechanical problems." Dr.
9 McHargue diagnosed her with bronchitis that was later ruled out. She referred the Applicant to
10 pulmonary specialists at UCSF, asking that they address the Applicant's "persistent pleuritic
11 pain, fatigue, and shortness of breath." She noted the Applicant's "acute pulmonary injury,
12 secondary to poor environmental conditions." Dr. McHargue told the Applicant that NW
13 Corporate Medical Officer, Dr. David Zanick, had later asked her to remove any reference to the
14 aircraft on the Applicant's medical record. Dr. McHargue had refused to do so and Dr. Zanick
15 later denied the allegation.

16
17 Two weeks later (January 2, 2001), Drs. Claman and Freemer examined the Applicant at the
18 UCSF Chest Faculty Practice. Dr. Freemer noted "possible irritant gas exposure," and noted that
19 the Applicant's condition is "work-related as per patient's report." Her lung function by that time
20 fell within the normal range. It is unknown whether there was a decrement compared to her lung
21 function pre-exposure because she had no baseline measurements. It is also possible that she had
22 largely recovered from the acute effects of ozone exposure, but was sensitized to subsequent
23 exposures. These pulmonary doctors did rule out bronchitis and asthma, but did not assess the
24 impact of exposure to the neurotoxin, TCP, because they were not qualified to do so and,
25 anyway, they were unaware of the exposure.

26
27 The Applicant returned to work on January 4, 2001 per the recommendation of the pulmonary
28 specialists. She again flew from San Francisco to Narita, and two days later, returned to San
29 Francisco. Upon arrival in San Francisco, she filed an on-the-job injury report with NWA for
30 symptoms that she experienced on both the outbound and return flights. She also telephoned her

1 Workers' Compensation Case Manager at Liberty Mutual Insurance to tell him that she "was not
2 the same" and needed to see a doctor. The Liberty Mutual representative, Michael Corona, told
3 the Applicant to expect a call from a Nurse Practitioner.
4

5 On January 11-13, 2001, the Applicant again flew from San Francisco to Narita and back. The
6 January 13, 2001 flight from Narita was the last trip she flew. That same day, she submitted an
7 injury report to NWA, and upon arrival in San Francisco, she sought treatment at the airport
8 clinic for pressure headaches, chest tightness, and chest pain. Dr. Kaye, an occupational health
9 physician employed by NWA, recognized the Applicant's "respiratory irritation", and noted
10 "possible exposures (ozone, etc)." On Line 18 of his "Doctor's First Report", he noted the
11 Applicant's "Hx [history] of the same symptoms, December 2000", and referred her to the UCSF
12 Division of Occupational and Environmental Medicine.
13

14 The Applicant met with UCSF occupational medicine specialists Drs. Field and Lombardo on
15 March 6, 2001. In their report, they noted that the Applicant's chest tightness, chest burning, and
16 nausea had resolved, but that she complained of progressive headaches and fatigue. The doctors
17 noted that the Applicant's "history suggests exposure to airborne contaminants on her flights on
18 December 11 and 13" (page 7) and that "the case for exposures is strengthened by the fact that,
19 according to the patient, many crewmembers and passengers experienced similar symptoms"
20 (page 7). The symptoms reported by passengers and other crewmembers are confirmed in the
21 pilot logbook, the mechanics' log book, the lead flight attendant's sworn statements, and the
22 incident reports that the lead flight attendant submitted to NWA. The doctors also noted that
23 "aircraft cabin air quality appears to have been compromised" (page 8), and that the Applicant's
24 respiratory complaints are consistent with ozone exposure (page 8). In addition, the doctors'
25 report acknowledges that aircraft occupants can be exposed to aerosolized engine oil, "suggested
26 as causing a constellation of symptoms" that are neurological in nature (page 8) and "it is
27 possible that [the Applicant] has developed a delayed neurotoxic effect to exposures sustained on
28 December 11 and 13" (page 9). These doctors did not rule out that the stress of these events may
29 have contributed to some of the Applicant's symptoms, but by no means did they consider stress
30 to be the primary cause of her complaints (page 9).

1 On April 26, 2001, the Applicant had her first visit with Dr. Harrison, another occupational
2 physician at UCSF. Based on her symptoms, Dr. Harrison concluded that the Applicant had been
3 "exposed to an unknown neurotoxin and respiratory irritant." That day, he rated the Applicant as
4 having been totally temporarily disabled since January 13, 2001 "as a result of this exposure."
5 Seven months later (November 29, 2001), he wrote that the Applicant "should now be
6 considered permanent stationary status and ratable due to her headache condition," with "no
7 evidence of pre-existing impairment." The Applicant still sees Dr. Harrison for him to treat her
8 ongoing migraine-type headaches and monitor her neurological symptoms.

9
10 On October 1, 2001, UCSF neurologist, Dr. Raskin, examined the Applicant for her headaches.
11 He concluded "the current problem is migraines which have been provoked by her toxic
12 exposure that occurred on the defective airplane last year that is certainly the proximate cause of
13 her current difficulty."

14
15 On January 9, 2002, Dr. Brautbar, a USC medical toxicologist, examined the Applicant. The
16 Defense has criticized this medical report as "putting the cart before the horse" because Dr.
17 Brautbar acknowledged the Applicant's complaints of "exposure to neurotoxic fumes." On the
18 contrary, Dr. Brautbar is aware of the potential for oil to contaminate the aircraft air supply
19 system, recognized the conditions that the Applicant described, is familiar with the specific
20 product that NWA used on its 747-200 fleet at the time (Exxon 2380), and recognized the
21 Applicant's symptoms of headaches, loss of balance, memory problems, lack of concentration,
22 body twitching, and tingling as being consistent with this exposure.

23
24 On February 26, 2002, NWA sent the Applicant to Dr. Leonard, an internal medicine specialist.
25 Dr. Leonard said that because he had no evidence of exposure to oils, it would "be an enormous
26 stretch" to conclude that such exposures had caused the Applicant's illness. Without an
27 understanding of the potential for the aircraft air supply system to get contaminated with engine
28 oil, this is not an unreasonable position. Meanwhile however, the Applicant had been trying, in
29 good faith, to obtain the necessary aircraft mechanical records from NWA, but the company did
30 not present even a subset of the said records until March 2005, ignoring the six written requests

1 from her union starting in January 2001, and only providing a delayed and partial response to the
2 subpoena issued by the Applicant's attorney on April 5, 2002.

3
4 Ultimately, the Applicant was able to use the mechanical records to demonstrate that: (1) The
5 Auxiliary Power Unit (a component of the aircraft air supply system, APU) had leaked oil so
6 severely that the four quart oil reservoir had run dry; (2) As a result of this severe oil leakage, the
7 APU had to be replaced; (3) The ductwork downstream of the APU had been coated with oil; (4)
8 The oil-coated ductwork was never cleaned and continued to act as a source of contamination
9 after the leaky APU had been removed; (5) More likely than not, the oil contaminated air caused
10 the catalytic converters to fail twice; and (6) More likely than not, the oil-contaminated air was
11 delivered to the passenger cabin. Unfortunately, Dr. Leonard was not privy to these mechanical
12 records when he met with the Applicant, but only as a result of NWA's failure to provide them as
13 requested, and by no fault of the Applicant.

14
15 On April 25, 2002, the Applicant appeared before Judge Berwald at the California
16 Unemployment Insurance Appeals Board. Judge Berwald concluded that "the clear weight of the
17 evidence supports a finding that the claimant is disabled and continues to be
18 disabled...Accordingly, the Department Determination [that she is ineligible for benefits] must be
19 reversed." After the Applicant's State Disability expired, she applied for Social Security
20 Disability Insurance and was awarded benefits dating back to January 11, 2001 (Claim #XXX),
21 benefits that she continues to receive as of this writing.

22
23 On August 20, 2002, NWA sent the Applicant to a psychiatrist, Dr. Munday. Like Dr. Leonard,
24 Dr. Munday had no insight into the chemical exposure conditions on the aircraft, although he did
25 "acknowledge that the cognitive testing does not rule out a neurotoxic cause" (page 19). He
26 described the Applicant as anxious and depressed. Depression and anxiety seem like normal
27 reactions to the Applicant's chronic symptoms that were serious enough to require that she give
28 up a career she enjoyed and, instead, spend most of her time alone at home.

1 On November 22, 2002, the Applicant was sent to another psychiatrist, Dr. Segal. Dr. Segal
2 stated that the Applicant has a "cognitive disorder with reactive depression and anxiety." He
3 noted that these symptoms are "in addition to her chronic headache disorder, migraine
4 headaches, other signs and symptoms of neurotoxicity, chronic fatigue, and chemical
5 sensitivities." He agreed that she is precluded from returning to work as a flight attendant.
6

7 On February 7, 2003, Dr. Segal submitted a supplemental report after he had reviewed the results
8 of Dr. Munday's neuropsychological testing. He noted that Dr. Munday had performed the
9 testing but had deferred the issues of diagnosis, causation, and future medical care to Dr. Segal, a
10 qualified psychiatric evaluator. Dr. Segal stated that his "opinion remains that [the Applicant's]
11 illness began with some kind of toxic exposure, in all medical probability" and that "from a
12 medical-legal standpoint, we still have an individual with substantial disability on an industrial
13 basis whether or not it is predominantly due to organic or psychological factors."
14

15 Finally, on June 27, 2003, NWA sent the Applicant to yet another psychiatrist, Dr. Whyman.
16 Because NWA still had not provided the Applicant with the mechanical records that
17 demonstrated the aircraft ductwork was contaminated with engine oil, Dr. Whyman had no
18 knowledge of the chemical exposure. He did, however, conclude that the "claimant's disability is
19 entirely industrial" and recommended 50 counseling sessions.
20

21 ARGUMENT

22 I

23 THERE IS OBJECTIVE EVIDENCE TO SUPPORT A FINDING OF INDUSTRIAL 24 EXPOSURE TO TOXINS THAT CAUSED THE APPLICANT TO SUSTAIN A 25 NEUROCOGNITIVE AND PHYSICAL DISABILITY

26
27 As stated in the Defendant's Trial Brief, Labor Code § 3202.5 places the burden on the applicant
28 to prove, by preponderance of evidence that she sustained an injury arising out of or during the
29 course of her employment. The statute defines preponderance as "that evidence that, when
30 weighed with that opposed to it, has more convincing force and greater probability of truth."

1 The Applicant readily meets this burden of proof for two chemical exposures: ozone gas that
2 explains her upper respiratory complaints, and aerosolized engine oil that explains the injury to
3 her head, immune system, and neurological system. As an aside, it is also natural that the stress
4 of the events on December 11 and 13, 2000, as well as the subsequent suffering from chronic and
5 preventable injuries, would have a negative impact on the Applicant's psyche.

6 7 **Ozone gas**

8
9 It is reasonable to conclude that cabin occupants, including the Applicant, were exposed to ozone
10 gas on the flights between San Francisco and Narita because: (1) They are high-altitude flights
11 where ozone gas is present; (2) It is documented that the catalytic converters had failed, so they
12 would not have been removing ozone from the outside air supply prior to supplying that air to
13 the cabin; and (3) There is a record of crewmembers and passengers on both the inbound and
14 return flights complaining of dry, irritated eyes and respiratory complaints (including decreased
15 lung function). A recent published review on the health effects of ozone exposure on aircraft
16 notes: "Exposure to ambient ozone causes chronic and acute adverse health effects. Respiratory
17 effects of ozone have been discussed in depth...Relevant to passenger exposures on commercial
18 aircraft are short-term effects that include reversible airway and eye irritation, and decreased
19 pulmonary function. Chronic exposure to ozone, although occurring as a series of acute doses,
20 has been associated with lower lung function¹."

21
22 Specifically, NWA knew upon arrival in San Francisco on December 11, 2000 that all three
23 ozone converters had failed, as is documented in the inbound pilot logbook and maintenance
24 history logbook for these three converters (Exhibit 14). The converters failed after 7403, 4907,
25 and 7452 hours, respectively, far short of the 10,000-hour minimum service life anticipated by
26 Boeing. It is highly unlikely that they were defective because all three units had been cleaned,
27 tested, inspected, and FAA certified by Limco Airepair Inc.

28
29
30

¹ Spengler JD, Ludwig, S, Weker, RA "Ozone exposures during trans-continental and trans-pacific flights." (2004)
Indoor Air, 14(Suppl 7): 67-73

1 It is also documented that upon arrival in San Francisco on December 13, 2000, all three ozone
2 converters had *again* failed, this time after only 9 hours and 33 minutes of service life (Exhibit
3 17). It is highly improbable that they were defective before being installed because again, all
4 three units had been cleaned, tested, inspected, and FAA certified by Limco Airepair Inc.
5 (Exhibit 16).

6 7 **Engine oil**

8
9 A published chemical analysis has confirmed that Exxon 2380 contains TCP, a potent
10 neurotoxin, and that carbon monoxide gas can be generated when Exxon 2380 is heated². It is
11 reasonable to conclude that cabin occupants, including the Applicant, were exposed to
12 aerosolized Exxon 2380 because:

13
14 (1) The mechanical records confirm that the ventilation ductwork had recently been
15 contaminated with engine oil from an APU that had leaked oil to the point that it ran dry
16 (Exhibit 15). The mechanics had replaced the leaky APU 18 days prior to the December
17 11, 2000 incident, but according to the maintenance records, the oil-contaminated
18 ductwork had not been replaced or cleaned;

19
20 (2) The air conditioning system schematic for the Boeing 747-200 aircraft shows that the
21 ozone converters and passenger cabin supply vents are downstream of the APU (Exhibit
22 I-1). During the hearing, the Defendant's witness, lead mechanic Mr. Bill XX, confirmed
23 that the documented oil leaking from the APU gear box vent drain would have been
24 ingested into the air compressor section of the APU and also would have contaminated
25 the ventilation ductwork downstream of the APU;

26
27 (3) The mechanical records confirm that the ozone converters failed prematurely twice
28 (Exhibits 14 and 17) and oil contamination is a recognized cause of failure. Engelhard
29 Corporation manufactured the ozone converters, and their product literature specifically

30
² van Netten, C "Air quality and health effects associated with the operation of a BAe 146-200 aircraft." (1998) Appl
Occup Environ Hyg: 13(10): 733-739

1 acknowledges that ozone converter failure is caused by deactivation of the catalyst
2 component. Further: "deactivation occurs when contaminants, most notably phosphorus,
3 silica, and/or sulfur, find their way to the surface of the monolith. These contaminants
4 have been shown to cover the surface of the catalyst. The contaminants covering the
5 catalyst prevents the ozone to oxygen reaction from occurring³."

6
7 (4) The nausea, vomiting, and bad headaches reported by crewmembers and passengers,
8 especially during the return flight, are typical initial symptoms of inhalation exposure to
9 aircraft engine oil, including Exxon 2380; and

10
11 (5) The Applicant's long-term neurological deficits of headaches, difficulty with memory and
12 concentration, balance problems, and muscle twitching, are consistent with the delayed
13 effects of inhalation exposure to aircraft engine oil, including Exxon 2380. For example,
14 a recent paper published by the US Naval Health Research Center Detachment
15 (Toxicology) states: "The construction of cabin pressurization systems of certain
16 commercial aircraft allows pyrolyzed [heated] jet oil to leak into the cabin air, often
17 producing visible smoke. The principal toxic constituents of this smoke are
18 tricresylphosphate, carbon monoxide, and N-phenyl-L-naphthylamine. Long-term
19 neurological effects alleged by airline workers could be due to tricresylphosphate and/or
20 carbon monoxide exposure.⁴" A recent published paper by a leading Gulf War Syndrome
21 researcher supports this position: "Organophosphate chronic neurotoxicity induced by
22 low-level inhalation of organophosphates present in jet engine lubricating oils and
23 hydraulic fluids of aircraft could explain the long-term neurologic deficits consistently
24 reported by crewmembers and passengers.⁵"

25
26
27
28 ³ Catalytic Converter Abbreviated Component Maintenance Manual, p/n's D-19333-1,-2,-3,-4, -5, SOP 0620 (2002)
29 Engelhard Corporation. Iselin, NJ

30 ⁴ Bobb, AJ "Known harmful effects of constituents of jet oil smoke." (Feb 2003) Naval Health Research Center
Detachment (Toxicology) TOXDET-03-04, Wright-Patterson AFB, Ohio

⁵ Abou-Donia, MB "Organophosphorus ester-induced chronic neurotoxicity." (Aug 2003) Archives of
Environmental Health, 58(8): 484-497.

1 In summary, the lead mechanic with 37 years of experience confirmed during the September 14,
2 2005 hearing that: (1) It is more likely than not that oil contamination from the failed APU
3 caused the ozone converters to fail prematurely the first time (reported on inbound flight (Narita
4 to San Francisco), December 11, 2000); (2) It is more likely than not that oil residue in the
5 ductwork caused the ozone converters to fail prematurely the second time (reported on the
6 inbound flight (Narita to San Francisco), December 13, 2000); and (3) It is more likely than not
7 that the oil residue in the air supply ductwork was aerosolized and supplied to the passenger
8 cabin.

10 II

11 12 **NWA KNOWINGLY DISPATCHED AN AIRCRAFT WITH A DEFECTIVE** 13 **AIR SUPPLY SYSTEM, DESPITE THE DOCUMENTED ILLNESS** 14 **REPORTED BY PASSENGERS AND CREW**

15 NWA chose to dispatch aircraft #6635 on December 11, 2000 for the San Francisco-Narita
16 flight, knowing that all three ozone converters had failed prematurely. In doing so, they
17 knowingly put the passengers and crewmembers (including the Applicant) at risk of exposure to
18 ozone gas and aerosolized engine oil. During that flight, the passengers and crewmembers,
19 including the Applicant, reported symptoms consistent with exposure to ozone gas and engine
20 oil.

21
22 NWA did finally replace the failed ozone converters in Seoul on December 12, 2000 after the
23 aircraft had stopped flying for the night. However, there is no indication in the mechanical
24 records that NWA investigated the *cause* of the failures, even though they knew that only 18
25 days prior, the APU had been leaking oil to the point that it ran dry and had to be replaced
26 (Exhibit 15). Further, as stated during the September 14, 2005 hearing by witness lead mechanic,
27 Mr. Bill XX, NWA had no procedures to clean oil-contaminated ductwork downstream of the
28 APU, and according to the ozone converter manufacturer, oil contamination is a recognized
29 cause of premature converter failure. In failing to address the source of the failed converters,
30 NWA again put passengers and crewmembers (including the Applicant) at risk of exposure to
ozone and aerosolized engine oil on the return flight from Narita to San Francisco. The company

1 claims to have never received the illness report that describes widespread illness reported by
2 crewmembers and passengers during that return flight, as reported by the lead flight attendant
3 (see September 14, 2005 hearing transcript).

4
5 The toxic exposures sustained by the crewmembers (including the Applicant) and passengers on
6 those two flights were preventable: NWA could have replaced the failed ozone converters in San
7 Francisco on December 11, 2000, investigated the root cause of the failures, and cleaned the oil-
8 contaminated ventilation ducting. Instead, it chose to dispatch the defective aircraft, first deny
9 and later delay the Applicant's requests for mechanical records, mislead NIOSH investigators,
10 and send the Applicant for psychiatric testing in an effort to discredit her injuries.

11 12 III

13 **NWA DID NOT ACT IN GOOD FAITH IN PRODUCING THE RELEVANT AND** 14 **NECESSARY MECHANICAL RECORDS THAT WOULD HAVE ASSISTED THE** 15 **APPLICANT'S PHYSICIANS**

16 Proving exposure to aerosolized engine oil or hydraulic fluid onboard commercial aircraft is
17 formidable, in part because the FAA does not require airlines to provide aircraft mechanical
18 records to affected crew or passengers, even though this is the only means a person has to prove
19 exposure. In this case, the Applicant's union first sent NWA two detailed requests for the
20 relevant aircraft mechanical records on January 11, 2001. NWA responded two weeks later with
21 a short excerpt from the captain's log book, but no mechanical records. On April 3, 2001, the
22 union submitted its second request for mechanical records. NWA did not respond. On January
23 11, 2002, the union submitted its third request. A month later, NWA wrote that it would not
24 release any reports unless it understood the relevance. On April 2, 2002, the union submitted its
25 fourth request, explicitly stating what NWA knew already: that the Applicant wanted to prove
26 the cabin air supply system was contaminated. Two weeks later, NWA again denied the request.
27 In the meantime, on April 5, 2002, the Applicant's attorney had subpoenaed NWA for the
28 mechanical records. On May 13, 2002, the union submitted its fifth request. That week, NWA
29 wrote that it had been subpoenaed and would not be responding to the union's requests. On June
30 19, 2002, NWA filed a Motion to Quash the "overly broad subpoena", although their motion was

1 denied a week later. On September 23, 2002, NWA did provide some documents, allegedly in
2 response to the subpoena, but they did not include any mechanical records, only a series of letters
3 and an incomplete set of inflight incident reports. Then again on January 14, 2003, NWA sent
4 the Applicant an incomplete collection of cabin irregularity reports and excerpts from the pilot
5 logbook, but not the history of mechanical records that had been requested. On July 26, 2004, the
6 union submitted its sixth request. The next day, NWA wrote that the aircraft mechanical records
7 are proprietary. At the trial held on August 4, 2004, the court ordered further discovery and
8 witnesses. This was understood by both attorneys to include the mechanical records that the
9 Applicant had been requesting since January 2001. Again at the Status Conference held on
10 November 3, 2004, the court ordered additional discovery and witnesses, including the
11 mechanical records that the Applicant had requested.

12
13 At the February 3, 2005 Status Conference, NWA provided another selection of excerpts from
14 the cabin irregularity reports (that describes broken tray tables and seatbacks that won't recline)
15 and the captain's logbook, but no mechanical records. In response to the Applicant's statement
16 during the hearing, explaining the ongoing refusal of the defense to provide the relevant and
17 necessary mechanical records, the court ordered the defense to "give her what she wants." On
18 March 23, 2005, NWA finally sent the Applicant a copy of some mechanical records. These
19 records did demonstrate the APU failure due to oil contamination (Exhibit 15), but did not
20 include the catalytic converter histories that demonstrate the premature failure of two sets of
21 catalytic converters (Exhibits 14 and 17). The Applicant obtained these records elsewhere. At the
22 May 16, 2005 Status Conference, the court allowed the Applicant to report that NWA still had
23 not provided her with a complete set of records. In response, the court verbally ordered NWA to
24 provide all of the relevant and requested records. NWA ignored this order. To date, NWA has
25 failed to provide complete mechanical records for aircraft #6635, even though the requests have
26 been narrow and specific, citing sections of Air Transport Association maintenance manual
27 chapters and histories for specific catalogued parts.

28
29 In 2002, a National Research Council committee recognized the potential severity of these bleed
30 air events and recommended that the FAA require carbon monoxide monitors in the air supply

1 ducting on all commercial aircraft, with standard operating procedures for pilots to respond to
2 elevated levels⁶. However, the FAA does not currently require airlines to monitor airborne
3 contaminants in aircraft air supply ducting. As a result, exposed individuals must rely on aircraft
4 mechanical records to prove exposure. Further, the FAA does not require an airline to investigate
5 the *cause* of failed ozone converters, nor must airlines replace failed ozone converters prior to
6 dispatching an aircraft. Airlines do not need to notify crew and passengers of the presence or
7 character of any chemical exposure during a flight, despite the fact that exposure to aerosolized
8 engine oil can have a chronic and delayed effect on the central nervous system.

9
10 **IV**

11 **THE MAJORITY OF THE APPLICANT'S DOCTORS RECOGNIZED CAUSATION,**
12 **EVEN WITHOUT SPECIFIC INFORMATION ON THE**
13 **NATURE OF THE AIRBORNE TOXINS**

14 In total, 13 doctors examined the Applicant: three with occupational specialties (McHargue,
15 Kaye, Harrison), five with pulmonary specialties (Claman, Freemer, Field, Lombardo, Leonard),
16 a neurologist (Raskin), a medical toxicologist (Brautbar), and three psychiatrists (Munday, Segal,
17 Whyman). It is striking that even though none of these 13 doctors had access to the aircraft
18 mechanical records that were discussed in detail at the September 14, 2005 hearing, seven stated
19 that she had initial symptoms consistent with exposure to a respiratory irritant such as ozone
20 (McHargue, Claman, Freemer, Kaye, Field, Lombardo, Harrison), and four stated that her largely
21 delayed neurological symptoms were consistent with exposure to a neurotoxin (Harrison, Raskin,
22 Brautbar, Segal). Dr. Munday did not rule out a neurotoxic cause, even with no hard evidence of
23 such an exposure, and the fact that Drs. Leonard and Whyman dismissed the neurotoxic cause is
24 somewhat understandable given that they had no evidence of any such exposure.

25
26 The Defense has attempted to discredit the Applicant for the fact that some of the objective
27 medical test results were inconclusive or negative. In fact, there are no definitive medical tests
28 available for affected crew or passengers to directly prove causation following a supply air
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30 ⁶ National Research Council Committee on Air Quality in Passenger Cabins of Commercial Aircraft: The Airliner
Cabin Environment and The Health of Passengers and Crew. National Academy Press, Washington, DC (January
2002).

1 contamination event like this. For example, a reduced level of the serum enzyme butyl
2 cholinesterase can be indicative of exposure to TCP, but it is not exclusive to TCP and can
3 normalize within a week. Similarly, a TCP exposure marker in the blood has been recently
4 developed for pigs, but additional work is necessary to apply the test to human blood. The
5 Applicant's physicians were at a further disadvantage because NWA had effectively denied their
6 access to the necessary aircraft mechanical records and Material Safety Data Sheet for the Exxon
7 2380 engine oil. Despite this, the majority of the Applicant's doctors recognized causation with a
8 toxic exposure. To illustrate the recognized need for an approved medical testing protocol for
9 crewmembers and passengers following these events, it is worth noting that in July 2005, the
10 FAA awarded funds to a team of physicians that are familiar with the hazards posed by exposure
11 to these toxins on commercial aircraft as part of a \$2.2M bleed air contamination research
12 project.

13
14 The Applicant was examined by three psychiatrists, two selected by NWA (Munday, Whyman)
15 and one selected by the Applicant's attorney (Segal). In its trial brief, the Defense has attempted
16 to convince the court that only one of these three opinions (Whyman) should be considered. This
17 request is inconsistent with the practice described by the Defense that "medical evidence should
18 be considered in light of the entire record." Dr. Munday interviewed the applicant for 2.25 hours
19 and reviewed her medical records for 1.75 hours. Presumably, if the Defense did not consider Dr.
20 Munday qualified, then it would not have sent the Applicant to see him. Dr. Segal interviewed
21 the Applicant for two hours, and reviewed both her medical records and published materials on
22 the subject of aircraft air supply contamination. He then spent another hour preparing a
23 supplemental report. In fact, Dr. Segal is the only psychiatrist that had any insight into the nature
24 of the toxic exposure on the aircraft. Dr. Whyman spent a comparable amount of time
25 interviewing the Applicant (three hours) but is no more or less qualified than the other two
26 psychiatrists, had no insight into the toxic exposure, and it is the Applicant's opinion that his
27 findings should be reviewed in that context.

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