NORTHWEST MOUNTAIN REGION RUNWAY INCURSION ACTION TEAM EVALUATION

Seattle-Tacoma International Airport
September 7, 2001

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Regional Runway Safety Program Manager

Northwest Mountain Region
Federal Aviation Administration

Definition of Runway Incursion

Any occurrence at an airport involving:

- **an aircraft**
- **a vehicle**
- **a person**
- **or an object**

on the ground that creates a collision hazard or results in loss of separation with an aircraft taking off, intending to take off, landing, or intending to land.

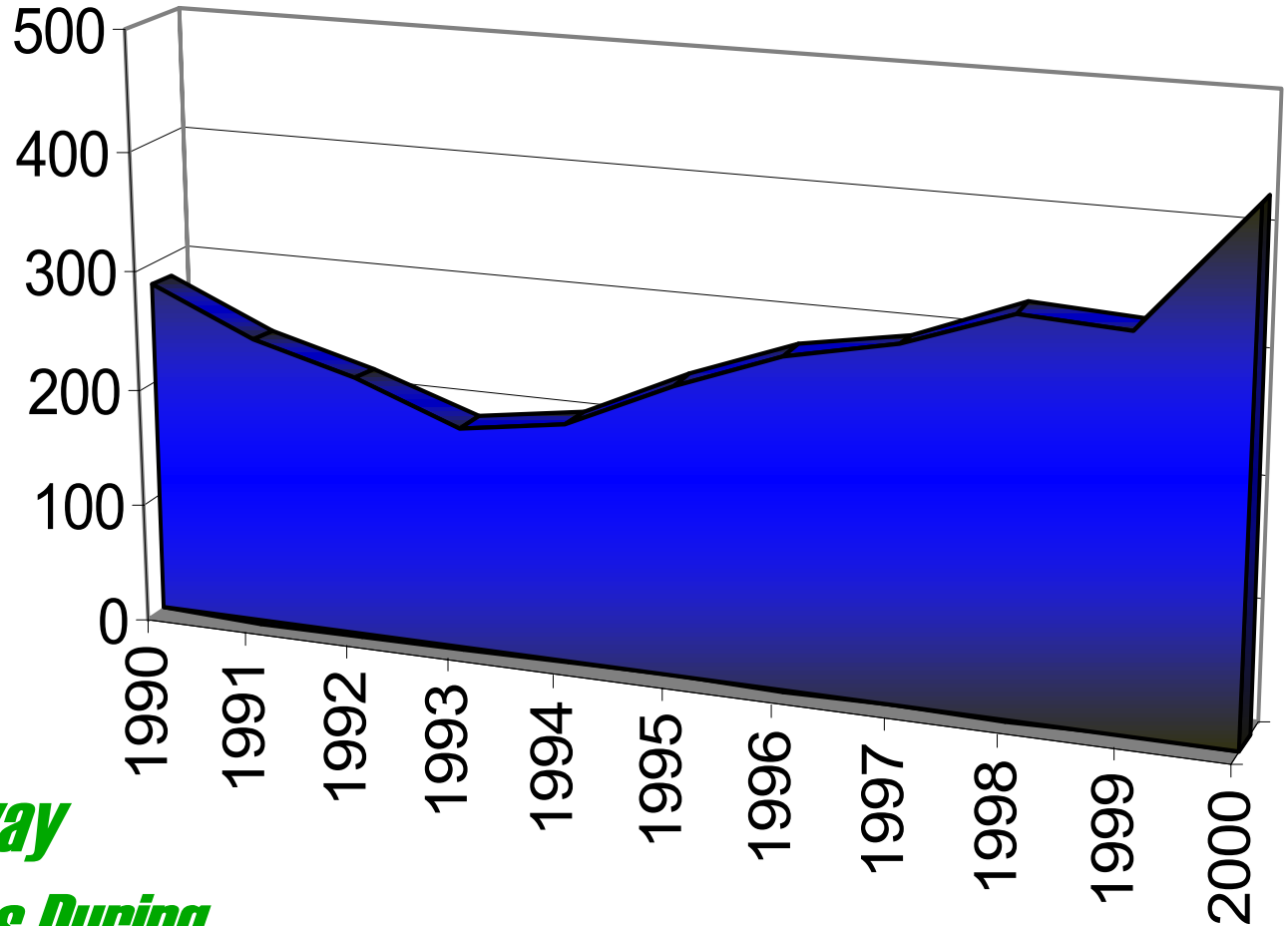
Sedan versus DC-10

Runway Incursion Types

Runway incursions result from three types of surface incidents:

- **Operational Errors (OE)**
- **Pilot Deviations (PD)**
- **Vehicle/Pedestrian Deviations (V/PD)**

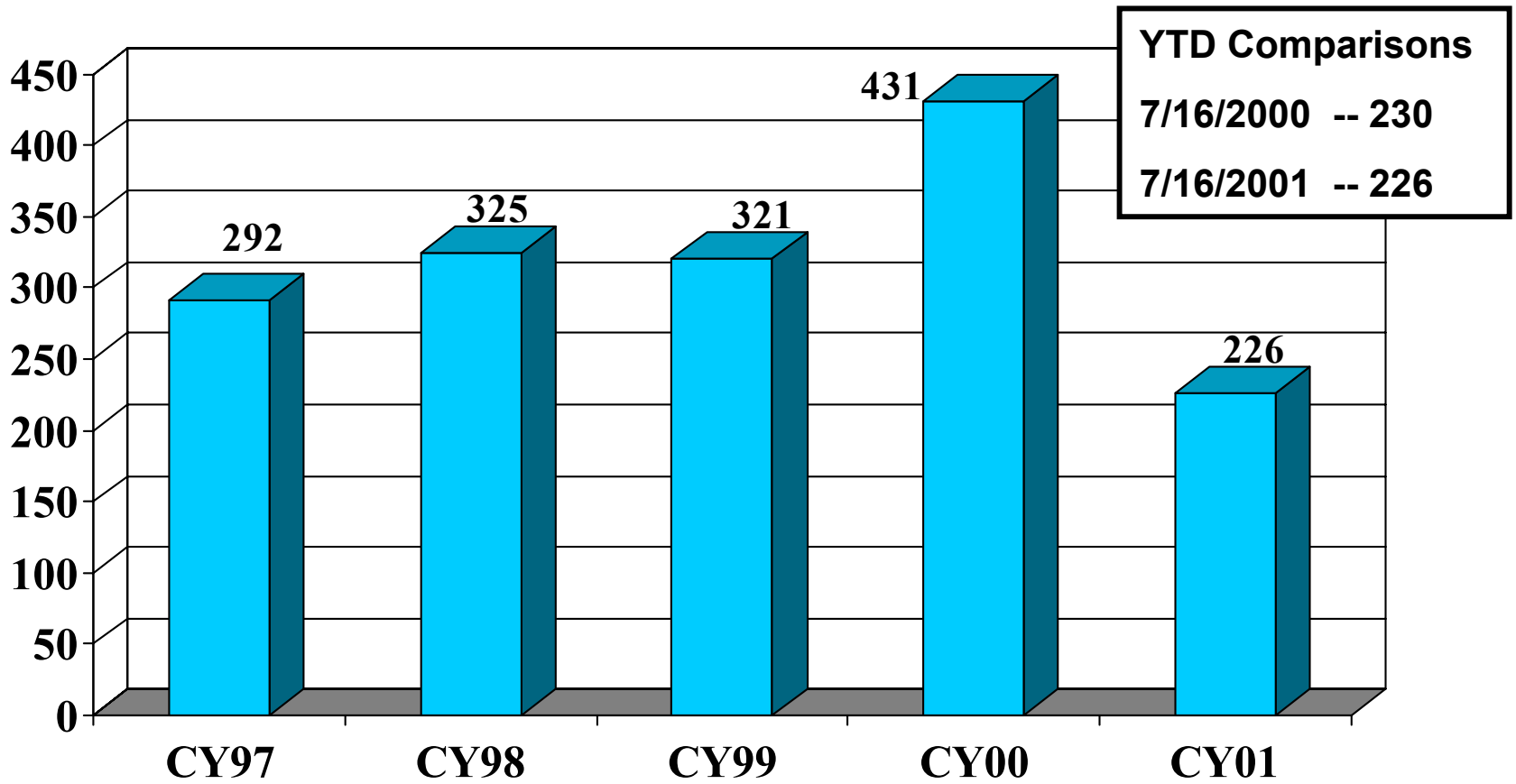
Trends



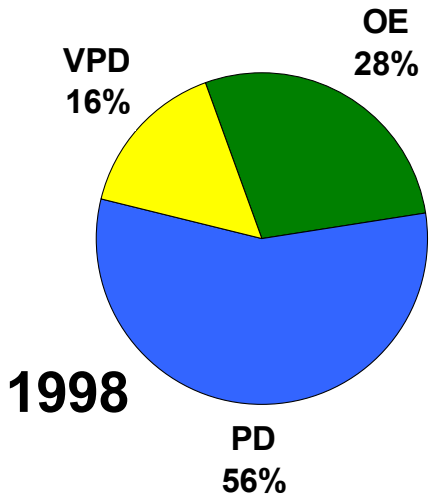
431 Runway Incursions During CY 2000

RUNWAY INCURSIONS

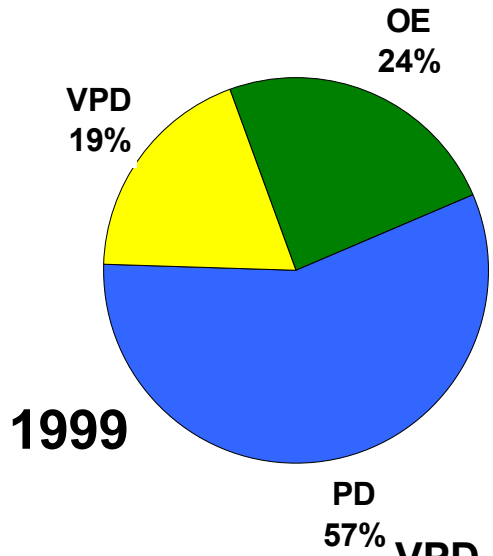
CY97 to DATE
(as of 7/16/01)



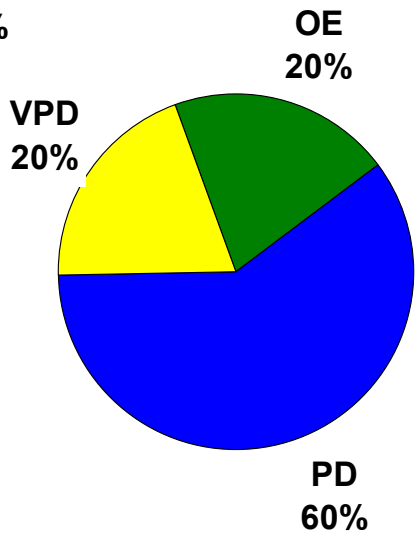
Trends - Incursions by type



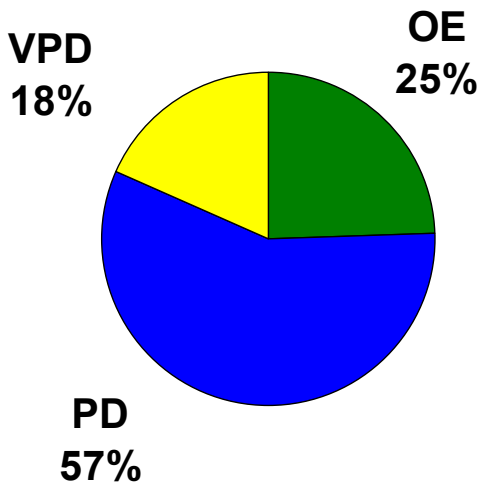
1998



1999



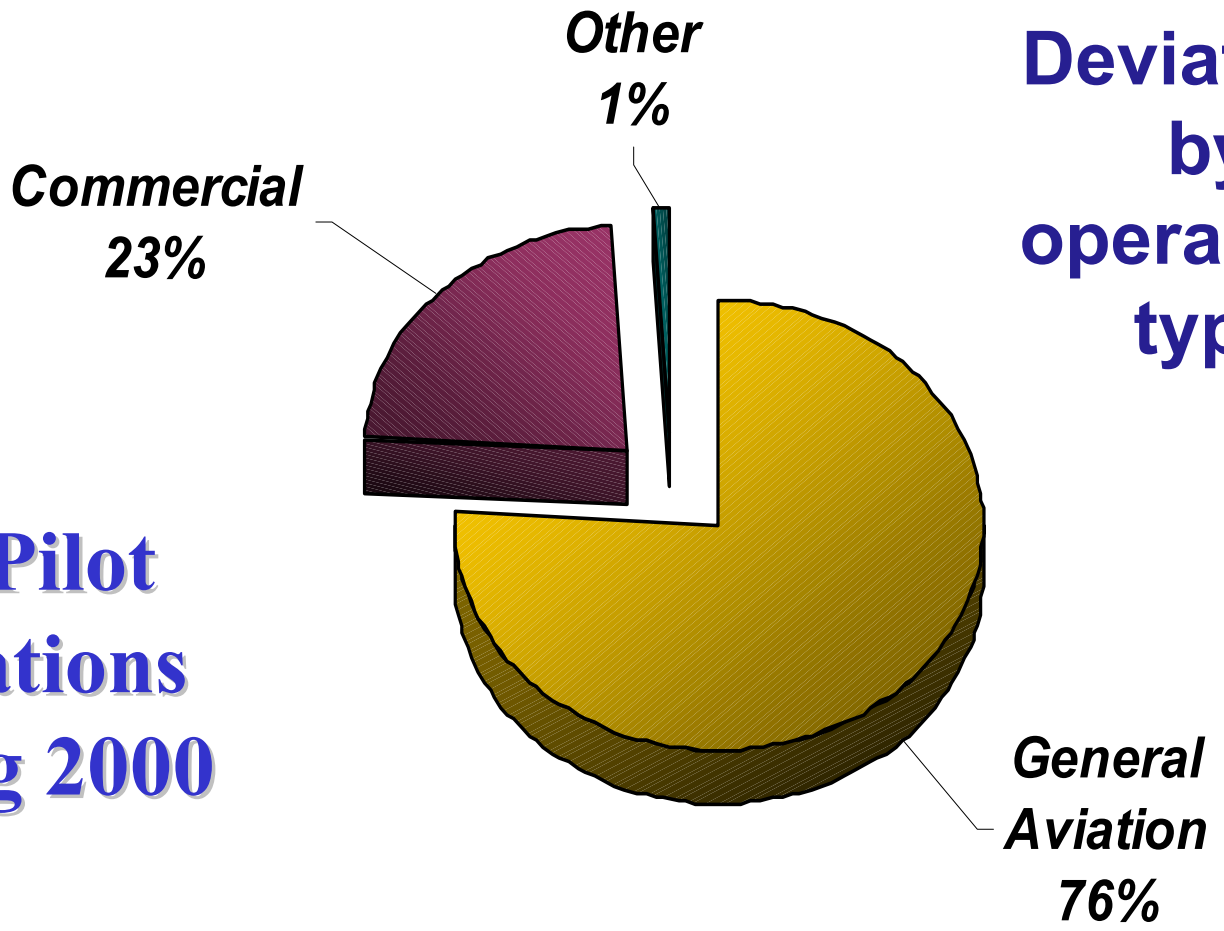
2000



Thru 21 Aug 2001

Trends

Pilot Deviations by operations type



256 Pilot Deviations during 2000

Top Incursion Airports

CY 2000

LOCATION	LOC ID	OPS	RI	RATE
North Las Vegas Arpt, NV	VGT	**229,703**	**16**	**6.97**
Montgomery Field/San Diego, CA	MYF	**260,235**	**9**	**3.46**
Fort Lauderdale Exec, FL	FXE	**263,359**	**9**	**3.42**
Merrill Field, Anchorage, AK	MRI	**201,148**	**8**	**3.98**
Long Beach Arpt, CA	LGB	**416,766**	**8**	**1.92**
Logan Arpt, Boston, MA	BOS	**512,985**	**8**	**1.56**
Los Angeles, CA	LAX	**786,421**	**8**	**1.02**
Jeffco Arpt, Denver, CO	BJC	**177,319**	**7**	**3.95**
Concord Arpt, CA	CCR	**212,112**	**7**	**3.30**
Orange Co/John Wayne Arpt, Santa Ana, CA	SNA	**405,473**	**7**	**1.73**
Santa Barbara, CA	SBA	**163,865**	**6**	**3.66**
Lambert Fld, St. Louis, MO	STL	**490,779**	**6**	**1.22**
Phoenix Sky Harbor Arpt, AZ	PHX	**632,360**	**6**	**0.95**
Troutdale Arpt, OR	TTD	**76,252**	**5**	**6.56**
Teterboro Arpt, NJ	TEB	**272,201**	**5**	**1.84**

Top Incursion Airports

CY 2000

LOCATION	LOC ID	OPS	RI	RATE
San Jose Arpt, CA	SJC	**300,365**	**5**	**1.67**
Bridgeport, CT	BDR	**90,760**	**4**	**4.41**
Greater Rockford Arpt, IL	RFD	**94,571**	**4**	**4.23**
McGhee Tyson Airport Knoxville, TN	TYS	**152,330**	**4**	**2.63**
Providence, RI	PVD	**157,470**	**4**	**2.54**
Sarasota/Bradenton Arpt, FL	SRQ	**174,515**	**4**	**2.29**
Palwaukee Muni, Chicago, IL	PWK	**185,236**	**4**	**2.16**
Albuquerque, NM	ABQ	**233,632**	**4**	**1.71**
Midway Arpt, Chicago, IL	MDW	**303,192**	**4**	**1.32**
Salt Lake City, UT	SLC	**370,681**	**4**	**1.08**
San Francisco, CA	SFO	**437,186**	**4**	**0.92**
Newark, NJ	EWR	**461,457**	**4**	**0.87**
Cincinatti-Covington Arpt, OH	CVG	**486,590**	**4**	**0.82**
O'Hare, Chicago, IL	ORD	**914,131**	**4**	**0.44**

Sweeper versus DC-9

RISK ASSESSMENT

Why We Assessed Data

- As a result of feedback from 2000 Summit, needed to place runway incursions into another context
- Need a better way to track incursions
- Need a better understanding of where incursions happen
- Need a way to analyze data to get at causal factors
- Need to describe clearer picture of runway incursion incidents – ***Not every incursion is a Tenerife***

Definitions

A Separation decreases to a point where the margin of safety is so low that the participants barely avoid a collision.*

B Separation decreases to a point where a significant potential for a collision existed.

C Separation decreases, or the potential for separation to decrease exists, but ample time and distance exist to avoid a potential collision.

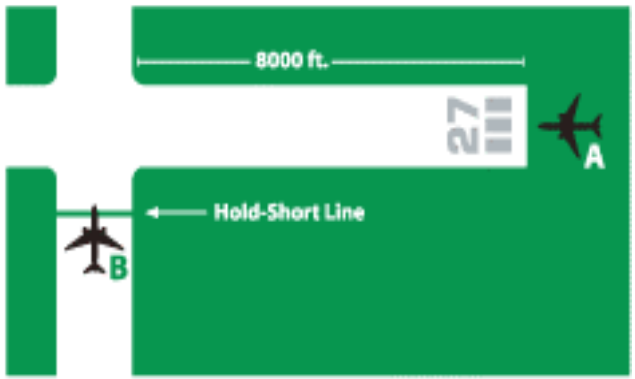
D Meets the definition of a runway incursion, with little or no risk of a collision.

* **The data contained in category A includes all accidents that occurred as a result of runway incursions (1997-2000), one in LaGuardia, NY & one in Sarasota, FL.**

Not all runway incursions are “created equal”

Case 1

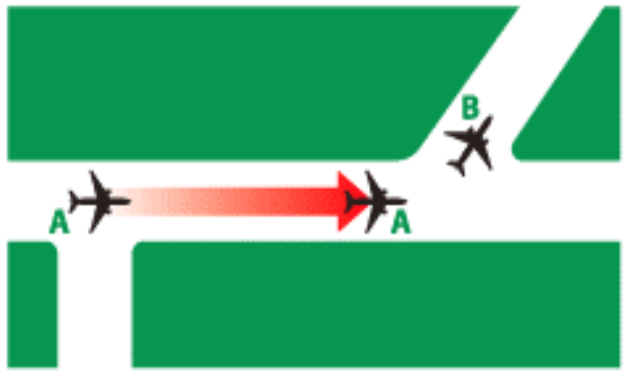
This incident meets the definition of a runway incursion, but there is little or no chance of collision.



- The potential for a collision is low
- Most frequently reported incursion

Case 2

This is a severe situation where the margin of safety is so low that a collision is barely avoided.



- Potential for a collision is high
- Typifies the common perception of a runway incursion
- More severe but less frequent

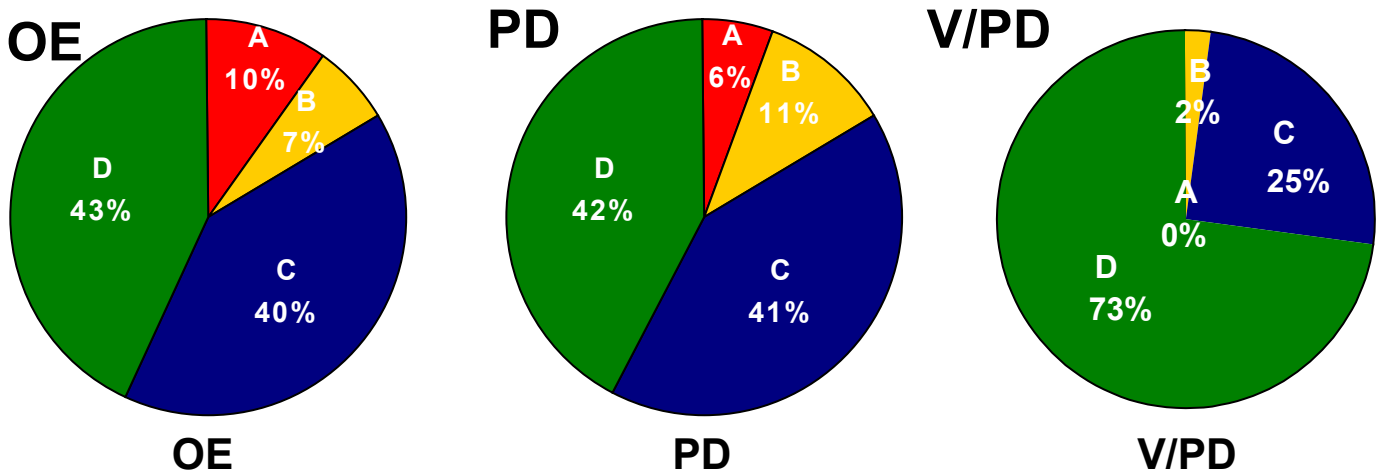
Runway Incursion Severity

The two simple cases illustrate that a variety of dimensions can dramatically impact the severity of a runway incursion.

Available Reaction Time	Evasive or Corrective Action	Environmental Conditions	Speed of Aircraft and/or Vehicle	Proximity of Aircraft and/or Vehicle

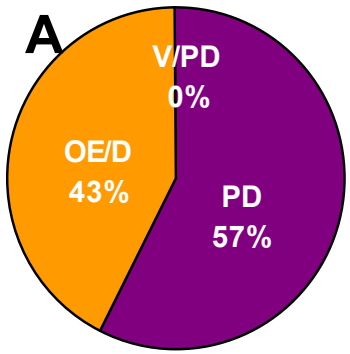
Category D	Category C	Category B	Category A	Accident
Little or no chance of collision but meets the definition of a runway incursion	Separation decreases but there is ample time and distance to avoid a collision	Separation decreases and there is a significant potential for collision	Separation decreases and participants take extreme action to narrowly avoid a collision	An incursion that resulted in a runway collision

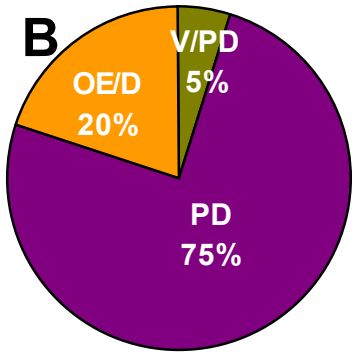
RUNWAY INCURSIONS
CALENDAR YEAR (CY) TO DATE
TYPE BY CATEGORY
AS OF 08/01

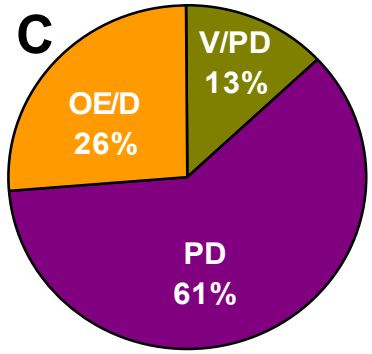


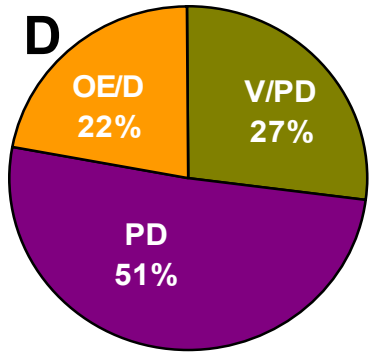
	OE	PD	V/PD
CY2001 YTD TOTAL 243	60	139	44
CY2000 YTD TOTAL 245	44	151	50

RUNWAY INCURSIONS
CALENDAR YEAR (CY) TO DATE
CATEGORY BY TYPE
AS OF 08/01

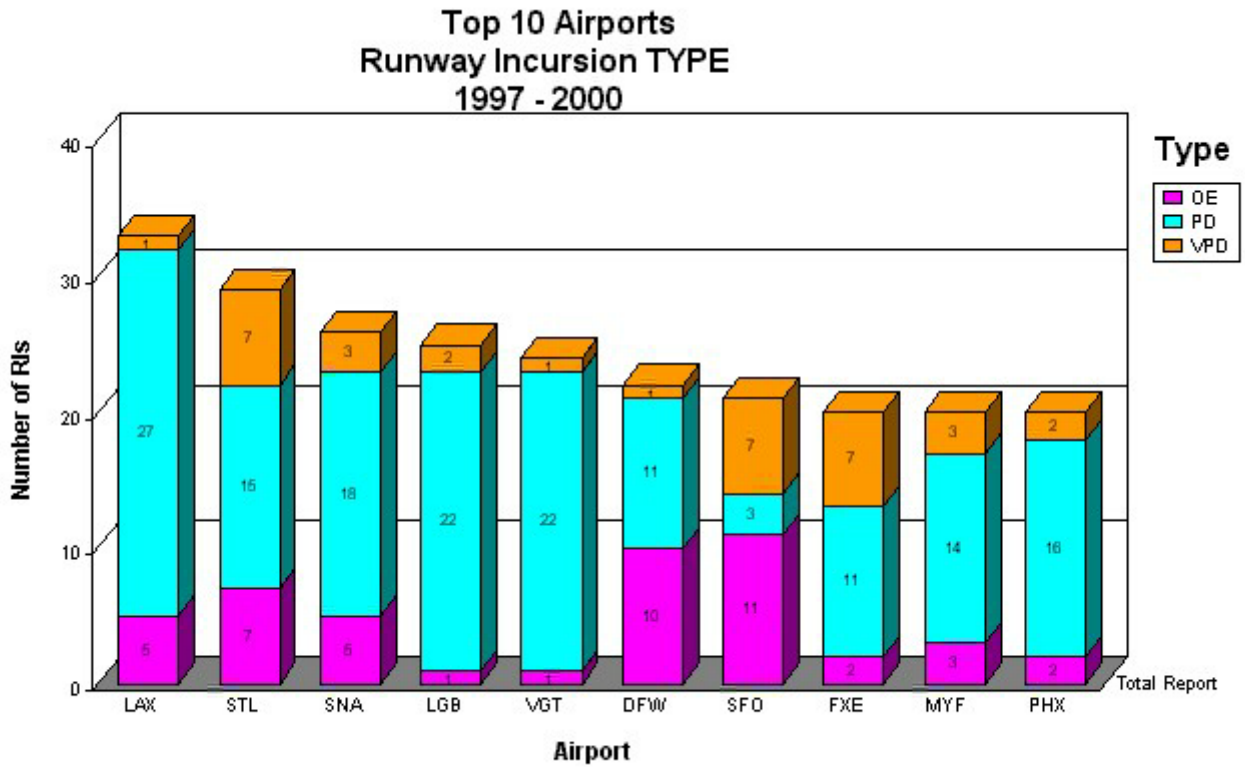








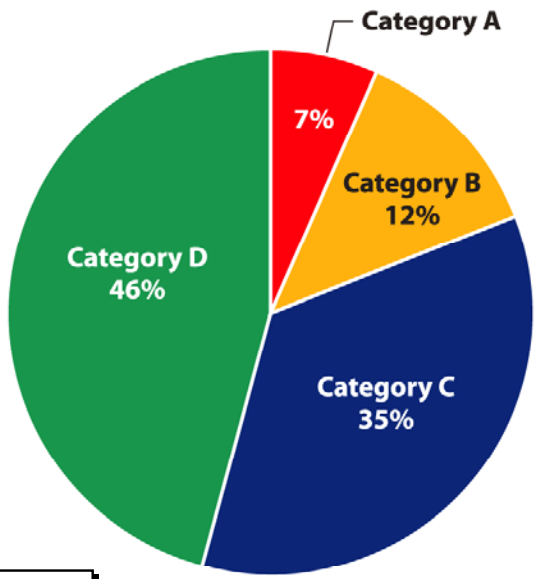
CATEGORY	A	B	C	D
CY2001 YTD TOTAL 243	14	20	92	117
CY2000 YTD TOTAL 245	14	31	82	118


Top 10 Airports
Runway Incursion TYPE
1997 - 2000
Number of RIs
40
30
20
10
0
Type
OE
PD
VPD
LAX
STL
SNA
LGB
VGT
DFW
SFO
FXE
MYF
PHX
Total Report
Airport

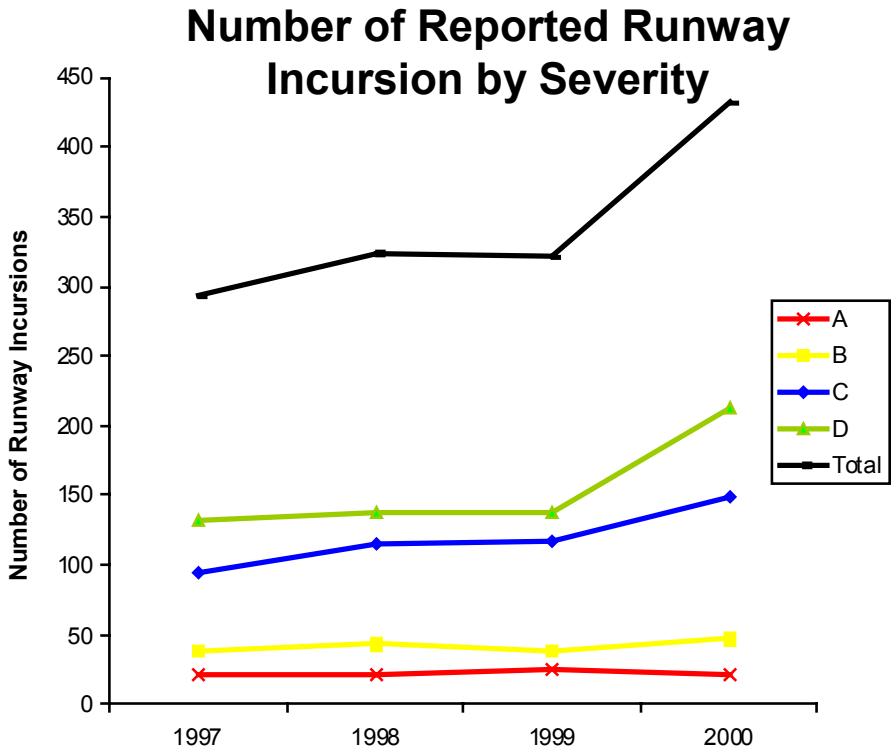
Number of Reported Runway Incursions by Severity

Figure 4.

Severity Distribution of Reported Runway Incursions 1997–2000



Total =1359



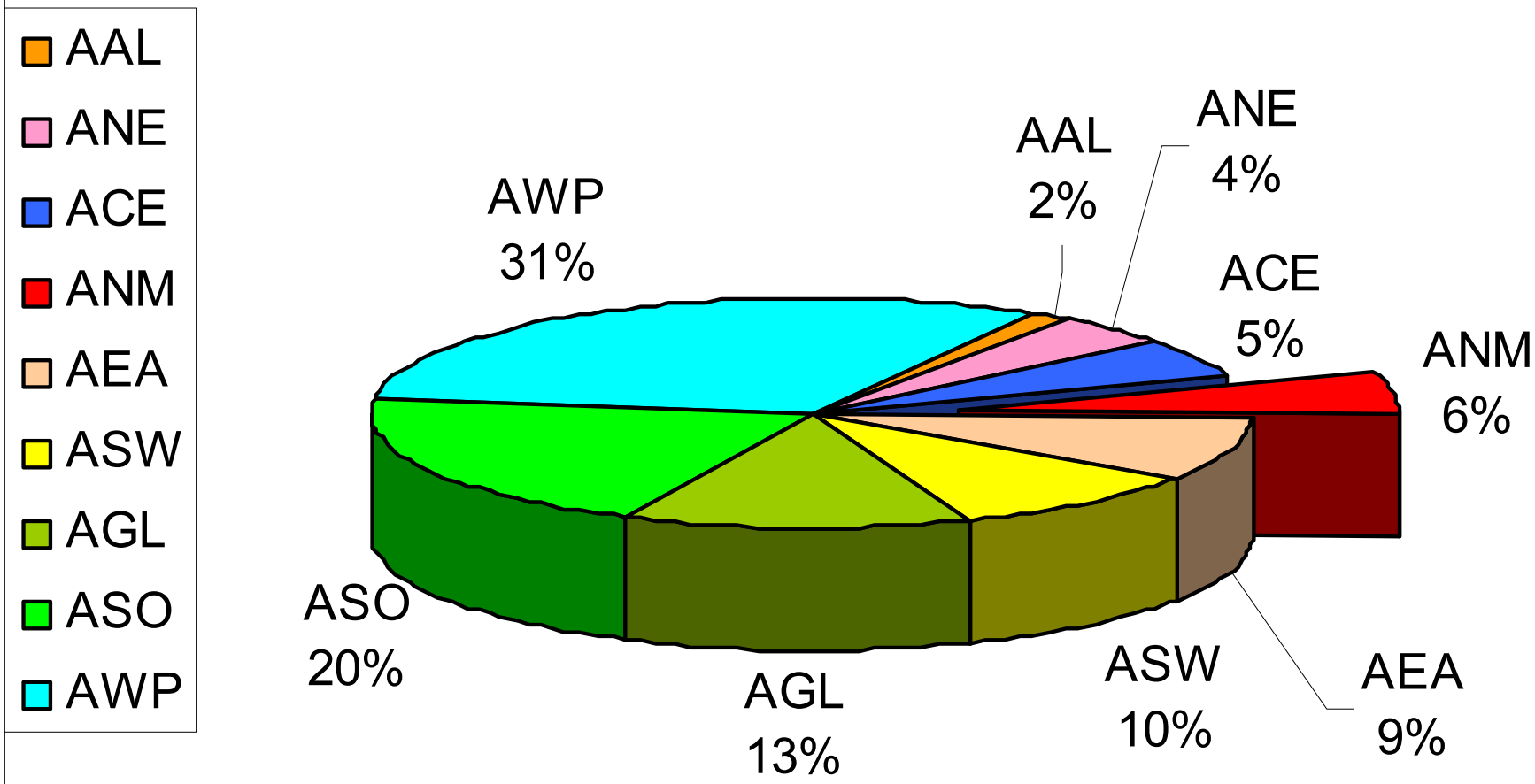
Note:

- *The total numbers are: 292, 325, 321, 431*
- *Accidents are listed as A events (1accident in 1997, 2 accidents in 2000)*
- *Does not include 10 events with insufficient data*

- The distribution of runway incursion severity categories from 1997 to 2000 indicates that the majority (81%) of the incidents was comprised of Category C & D events.

- There were 110 more reported runway incursions in 2000 than in 1999. Category C & D events accounted for 106 out of these 110 events.

% of Total Runway Incursions



Primary Causes of Runway Incursions

- Breakdown in Pilot/Ground Vehicle/Controller Communications
- Lack of Airport Familiarity
- Loss of Situational Awareness

Snow Plow versus Wingtip

Runway Safety Program

www.faa.gov/runwaysafety

- Home
- Current Events
- The Cockpit
- The Tower
- On the Ground
- Technologies
- Human Element
- Newsroom
- Statistics & Data
- About Us
- Partners
- Links
- Contact Us

Create your own Airport Runway Safety Website, *FREE*!

In an effort to promote safer surface operations, the Runway Safety Program now offers all airports, regardless of size or use, the ability to create their own websites. Airports can now inform the flying public about airport hot spots, local procedures, operations, runways specifications, communications, and much more. Airports will even have the option of posting pictures and diagrams. create website

Airport Signs, Markings & Lighting

Knowing airport signs, markings & lighting is the cornerstone to safe surface operations. Take a few minutes and review the current standards. view

Runway Safety - Microsoft Internet Explorer

File Edit View Favorites Tools Help

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Address http://www.faa.gov/runwaysafety/ Go Links

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- On the Ground
- Technologies
- Human Element
- Newsroom
- Statistics & Data
- About Us
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- Links
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Runway Safety Program

the cockpit

Airport Taxi Diagrams

To reduce runway incursions, the FAA has teamed up with the AOPA Air Safety Foundation to make taxi diagrams available for more than 330 of the busiest U.S. airports. ***The best part...it's free!*** view

Great Idea!

Operations at Towered Airports

This graphic-intensive Safety Advisory discusses the procedures for operating at towered airports. Learn about airport lighting, signs, markings, communications, procedures, charts, and much more. view

Airport Signs, Markings & Lighting

Knowing airport signs, markings & lighting is the cornerstone to safe surface operations. Take a few minutes and review the current standards. view

..We Respond We Listen. Internet

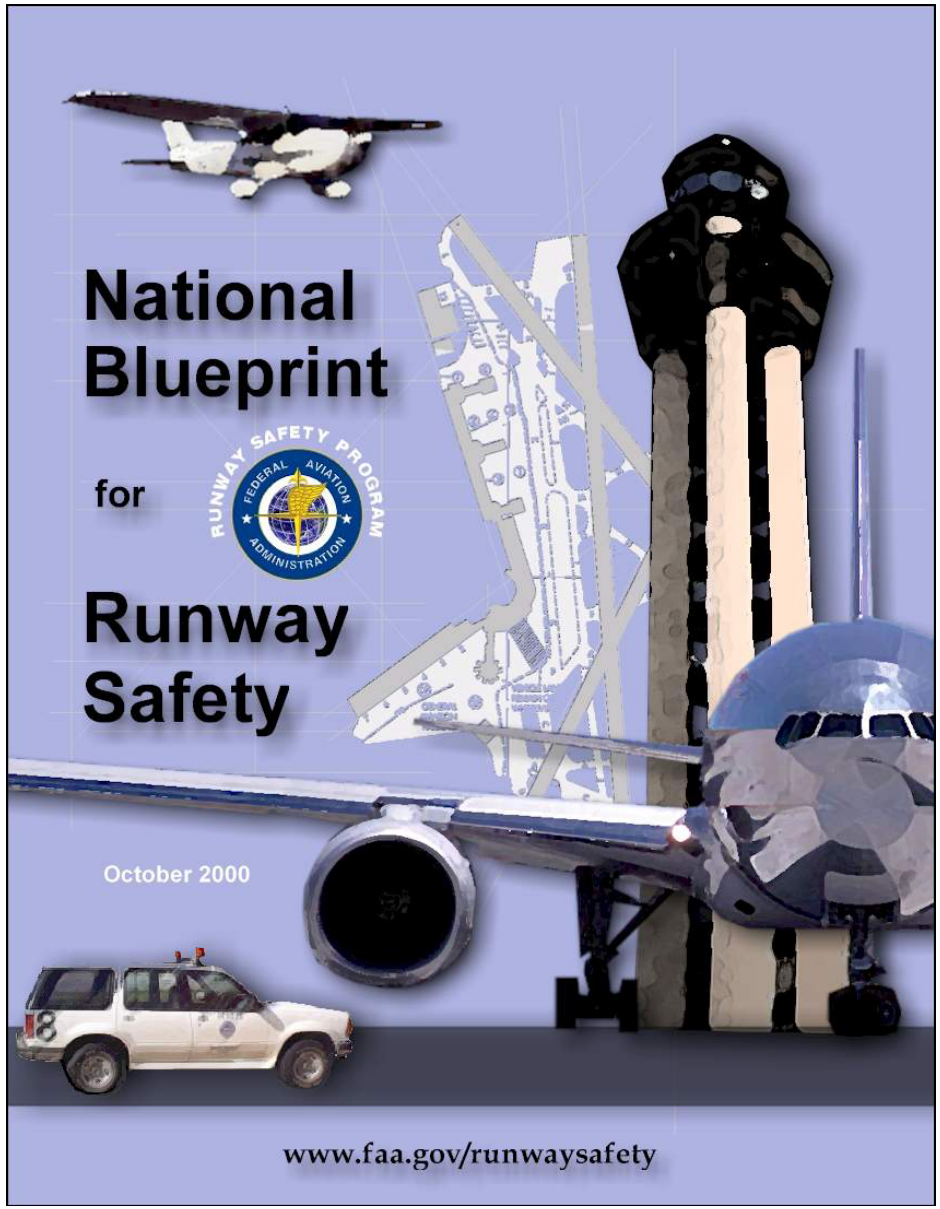
Start Microsoft Word Lotus cc:Mail - [Mailbox #1 ... Microsoft PowerPoint - [AA... Runway Safety - Micr... 5:42 PM

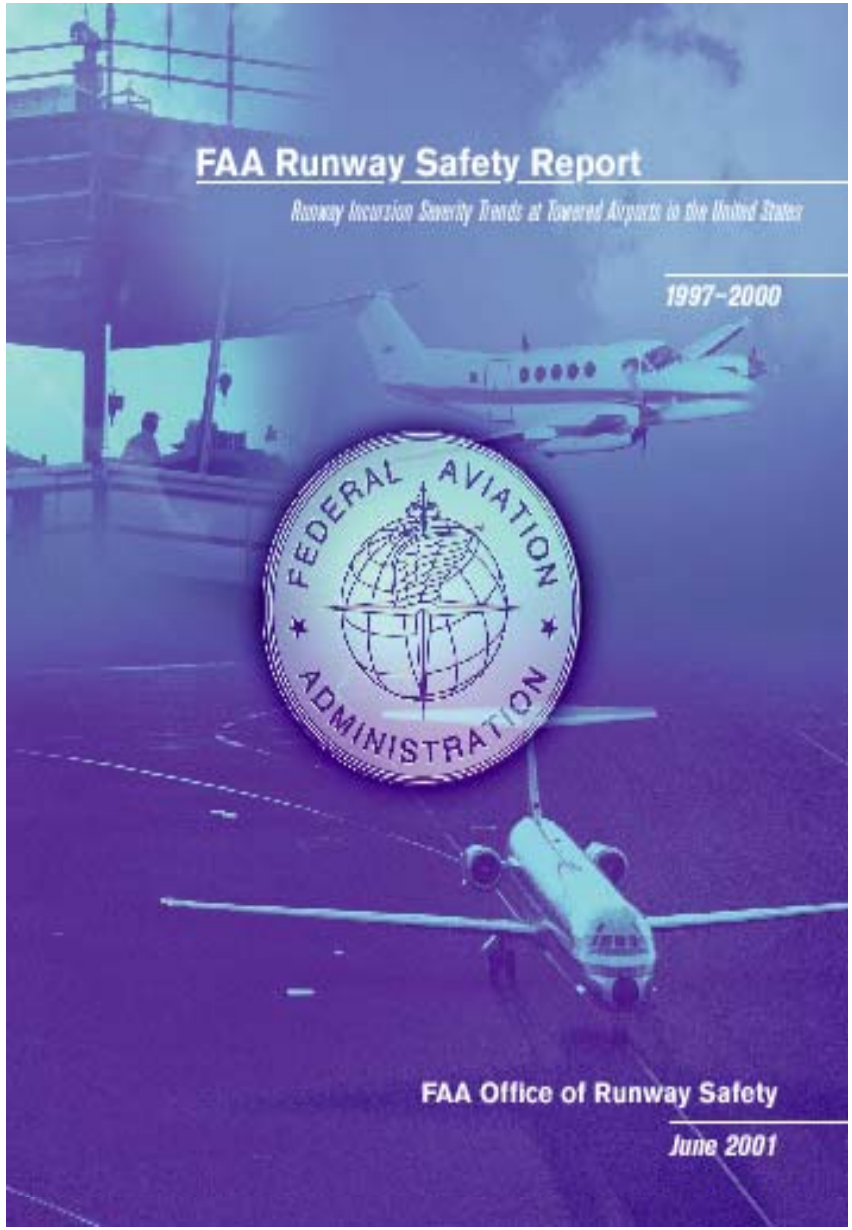
Runway Safety Program

statistics & data

STATISTICAL DATA

- Runway Incursion Totals CY00 vs. CY99 (Updated Daily)
- Regional Runway Incursion Totals - CY00 (Updated Daily)
- Runway Incursion Totals CY00 vs. CY98
- 2000 Runway Incursion Reduction Goal
- Runway Incursions by Category (1988-1999)
- Runway Incursions by Month (1997-1999)
- Runway Incursion Rates with Total Operations (1988-1999)
- Quarterly Operational Errors (1997-1999)
- Quarterly Pilot Deviations (1997-1999)
- Pilot Deviations by Part (1997-1999)


National
Blueprint
for
Runway
Safety
October 2000
www.faa.gov/runwaysafety


FAA Runway Safety Report
Runway Incursion Severity Trends at Towered Airports in the United States
1997–2000
FEDERAL AVIATION ADMINISTRATION
FAA Office of Runway Safety
June 2001

Airport Signs & Markings Quiz

Start Here

Place the number(s) of each sign or marking matching the description in the description box.
(Each sign or marking may be used once, more than once, or not at all.)

A. Indicates you are approaching a runway .....

B. Shows places you should not taxi an aircraft .....

C. Indicates you do, or may, need ATC approval to cross .....

D. Tells you the runway or taxiway you are on .....

E. Sign giving you directions to a runway, taxiway, or other airport destination .....

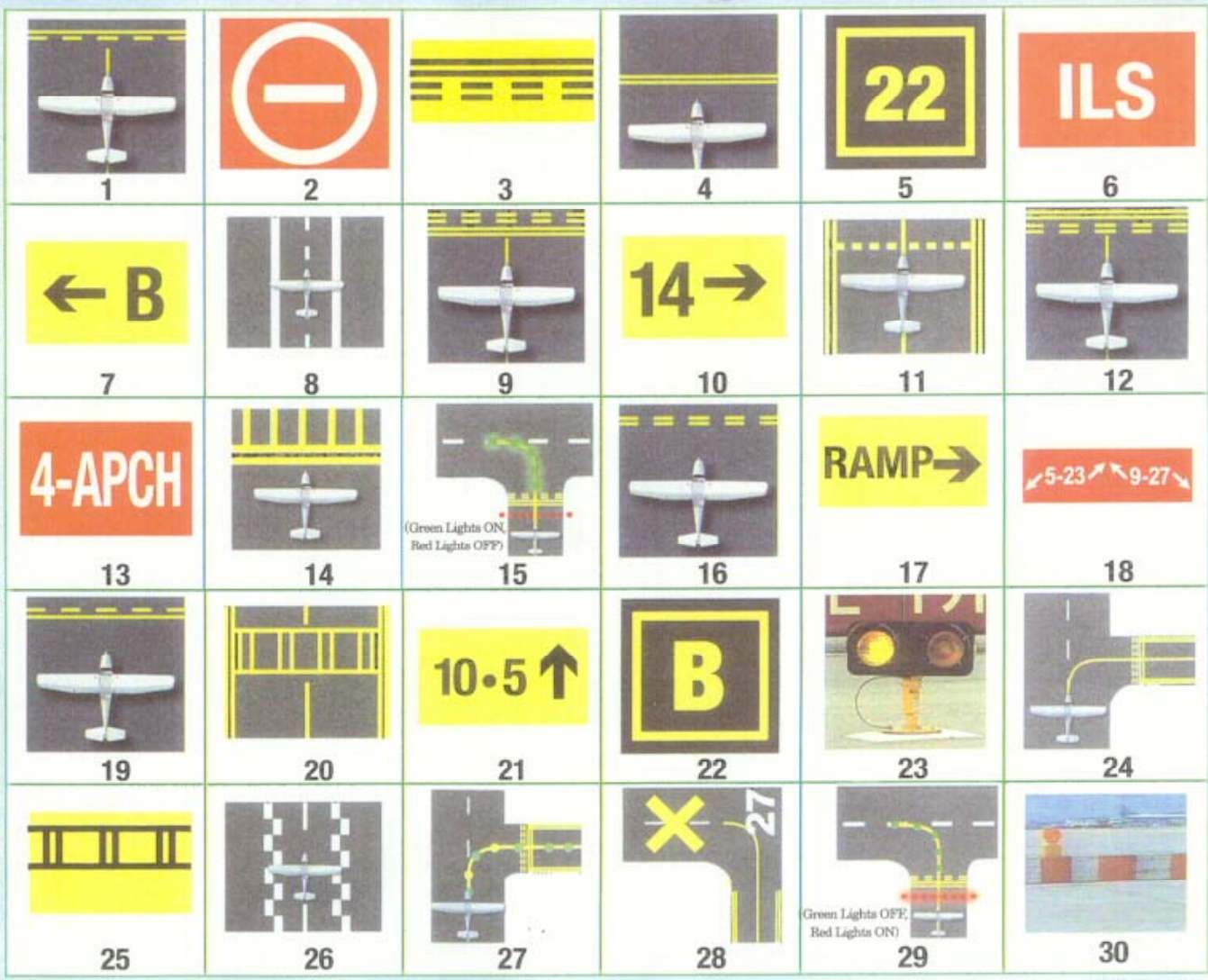
F. Indicates you're about to enter an area that could cause interference with an ILS signal .....

G. Helps you find your way off a runway .....

H. Confirms you are cleared onto a runway (tower - controlled airport) .....

I. Used to indicate you're about to cross a runway approach or departure path .....

J. Tells you where you should hold short of a crossing taxiway .....



FAA-P-8740-64
AFS-803 (2000)

U.S. Department of Transportation
Federal Aviation Administration

Advisory Circular

Subject:	Date: 6/18/01	Initiated by: AFS-800	AC No: 91-73
PART 91 PILOT AND FLIGHTCREW PROCEDURES DURING TAXI OPERATIONS AND PART 135 SINGLE-PILOT OPERATIONS			Change:

1. PURPOSE. This advisory circular (AC) provides guidelines for the development and implementation of standard pilot procedures for conducting safe aircraft operations on the airport surface. It is intended for use by Title 14 of the Code of Federal Regulations (14 CFR) part 91 operators and part 135 operators conducting single pilot flight operations. These guidelines should become an integral part of all standard operating procedures, flight operations manuals, and formal training programs. Standard use of developed procedures should be emphasized during the certification and proficiency training of all pilots. The use of standard procedures for operating on the airport surface should further be emphasized during the flight review (refer to 14 CFR part 61, section 61.56) of all certificated pilots.

> **NOTE: Pilots operating aircraft under 14 CFR parts 121, 125, or 135 (those part 135 flight operations where 2 or more pilots are in the cockpit) refer to AC 120-XX, Part 121, 125, and 135 Flightcrew Procedures During Taxi Operations.**

2. FOCUS. This guidance focuses on the activities occurring on the flight deck/cockpit (e.g., planning, communicating, coordinating), as opposed to the actual control of the aircraft (e.g., climbing, descending, maneuvering). Although there are many similarities, taxi operations for single piloted aircraft, as opposed to taxi operations for aircraft that require more than one pilot, present distinct challenges and requirements. These distinct challenges are elaborated, when necessary, throughout the guidance. An additional section is provided concerning operations at airports without operating control towers. Finally, a section is devoted to the use of exterior aircraft lights in making an aircraft more conspicuous to all other persons directly involved in airport flight and ground operations.

3. RELATED READING MATERIAL. The following documents and web sites contain useful information regarding runway safety. FAA ACs can be found on

U.S. Department of Transportation
Federal Aviation Administration

Advisory Circular

Subject:	**PART 121, 125, AND 135 FLIGHTCREW PROCEDURES DURING TAXI OPERATIONS**	Date: 6/18/01 Initiated by:	**AFS-200**	AC No:	**120-74**
				Change:	

1. PURPOSE. This advisory circular (AC) provides guidelines for the development and implementation of standard operating procedures for conducting safe aircraft operations during taxiing. It is intended for use by persons operating aircraft under parts 121, 125, and 135 (those part 135 flight operations where two or more pilots are in the cockpit) of Title 14 of the Code of Federal Regulations (14 CFR). The Federal Aviation Administration (FAA) recommends that these guidelines become an integral part of all standard operating procedures, flight operations manuals, and formal flight crewmember training programs. The use of flightcrew procedures should be emphasized and employed during all phases of a flight crewmember's aircraft ground and flight training programs.

> **NOTE: Persons operating aircraft under 14 CFR part 91 general operating and flight rules and for part 135 flight operations where only 1 pilot is in the cockpit, refer to AC 91-XX, Part 91 Pilot and Flightcrew Procedures During Taxi Operations and Part 135 Single-Pilot Operations.**

2. FOCUS. This guidance focuses on the activities occurring within the cockpit (e.g., planning, communicating, coordinating), as opposed to the actual control of the aircraft (e.g., steering, maneuvering). Taxi operations present distinct challenges and requirements not found in other phases of flight operations. These distinct challenges are elaborated, when necessary, throughout the guidance. An additional section is provided concerning operations at airports without operating control towers. Finally, a section is included on the use of exterior aircraft lights during ground operations which make an aircraft more conspicuous to other flightcrews.

3. RELATED READING MATERIAL.

a. Aeronautical Information Manual (AIM)

- Be aware
- Listen!
- Ask questions
- Stick to business
- ***STOP*** if in doubt
- Read back
- Once again ...

IF YOU DO NOT UNDERSTAND

ASK!

10 Ways To Help Prevent Runway Incursions

1 See The "Big Picture"
Monitor both ground and tower communications when possible.

2 Transmit Clearly
Make your instructions and read backs complete and easy to understand.

3 Listen Carefully
Listen to your clearance. Listen to what you read back. Do not let communications become automatic.

4 Copy Clearances
Clearances can change. Keep a note pad and copy your clearance. If needed refer to your notes.

5 Situational Awareness
Know your location. If unfamiliar with an airport keep a current airport diagram available for easy reference.

6 Admit When Lost
If you get lost on an airport ask ATC for help. Better to damage your pride than your airplane.

7 Sterile Cockpit
Maintain a sterile cockpit until reaching cruising altitude. Explain to your passengers that talking should be kept to a minimum.

8 Understand Signs, Lights And Markings
Keep current with airport signs, lights and markings. Know what they mean and what action to take.

9 Never Assume
Do not take clearances for granted. Look both ways before entering or crossing taxiways and runways.

10 Follow Procedures
Establish safe procedures for airport operations. Then follow them.

ANM Points of Contact

(ANM Runway Safety Team)

- ***Runway Safety Program Manager, ANM-1R, Jim Greene, (425) 227-1369 Jim.k.greene@faa.gov***
- ***Airports Division, ANM-600, Mark Taylor, (425) 227-2625 Mark.taylor@faa.gov***
- ***Flight Standards, ANM-200, Mary Hoy, (425) 227-2262 Mary.Hoy@faa.gov***
- ***Airway Facilities Operations, ANM-400, Willie Eigner, (425) 227-2336 Willie.eigner@faa.gov***
- ***Air Traffic Control, ANM-500, Don Bringmann, (425) 227-2550 Donald.bringmann@faa.gov***

We Listen….

We Respond

Pickup Truck versus B-747

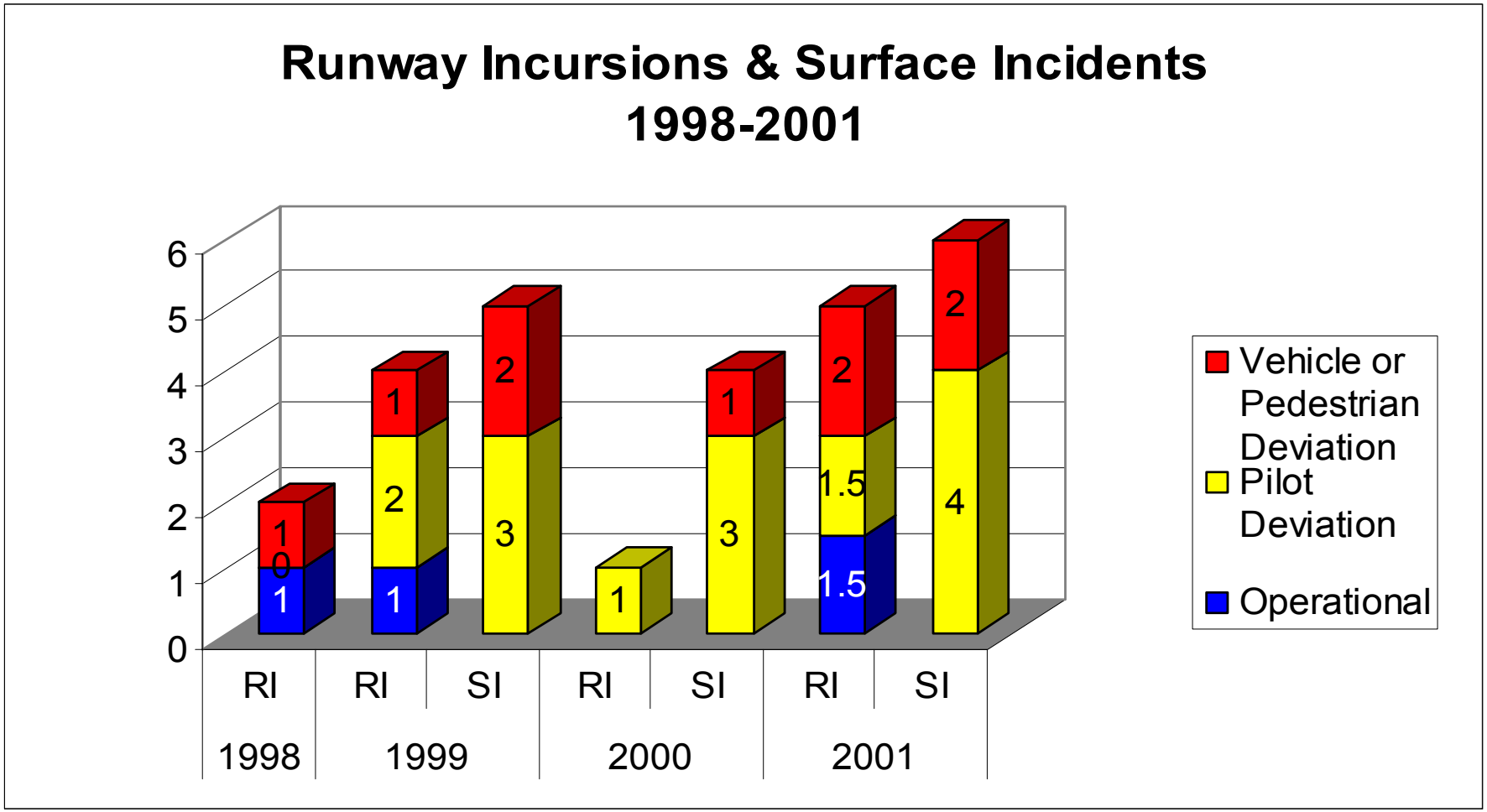
Local Problems require local Solutions

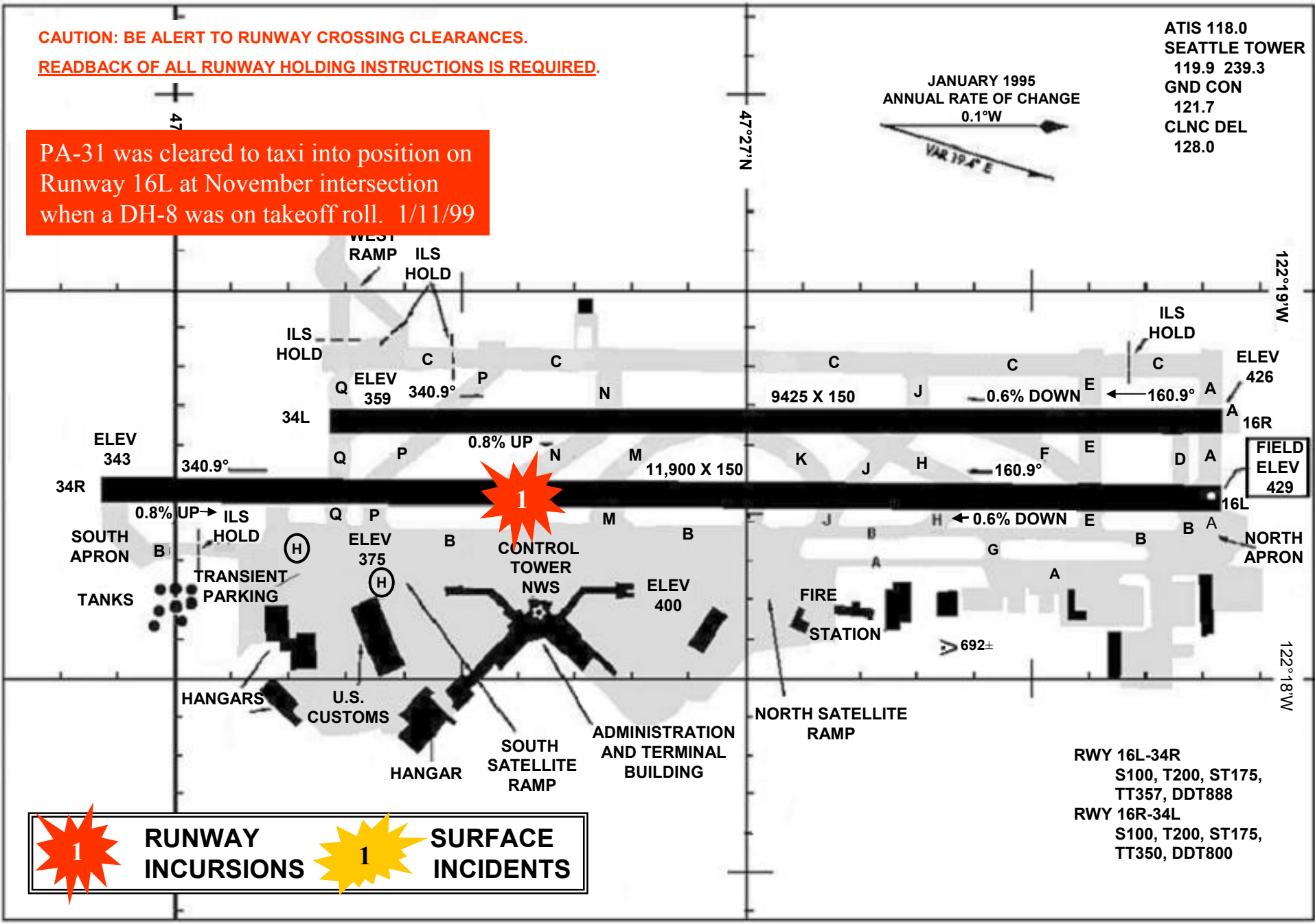

AIRCRAFT MOVEMENT AREA
STOP
DO NOT PROCEED
WITHOUT CLEARANCE
FROM PAINE TOWER
VEHICLES REQUIRE A
FLASHING AMBER BEACON

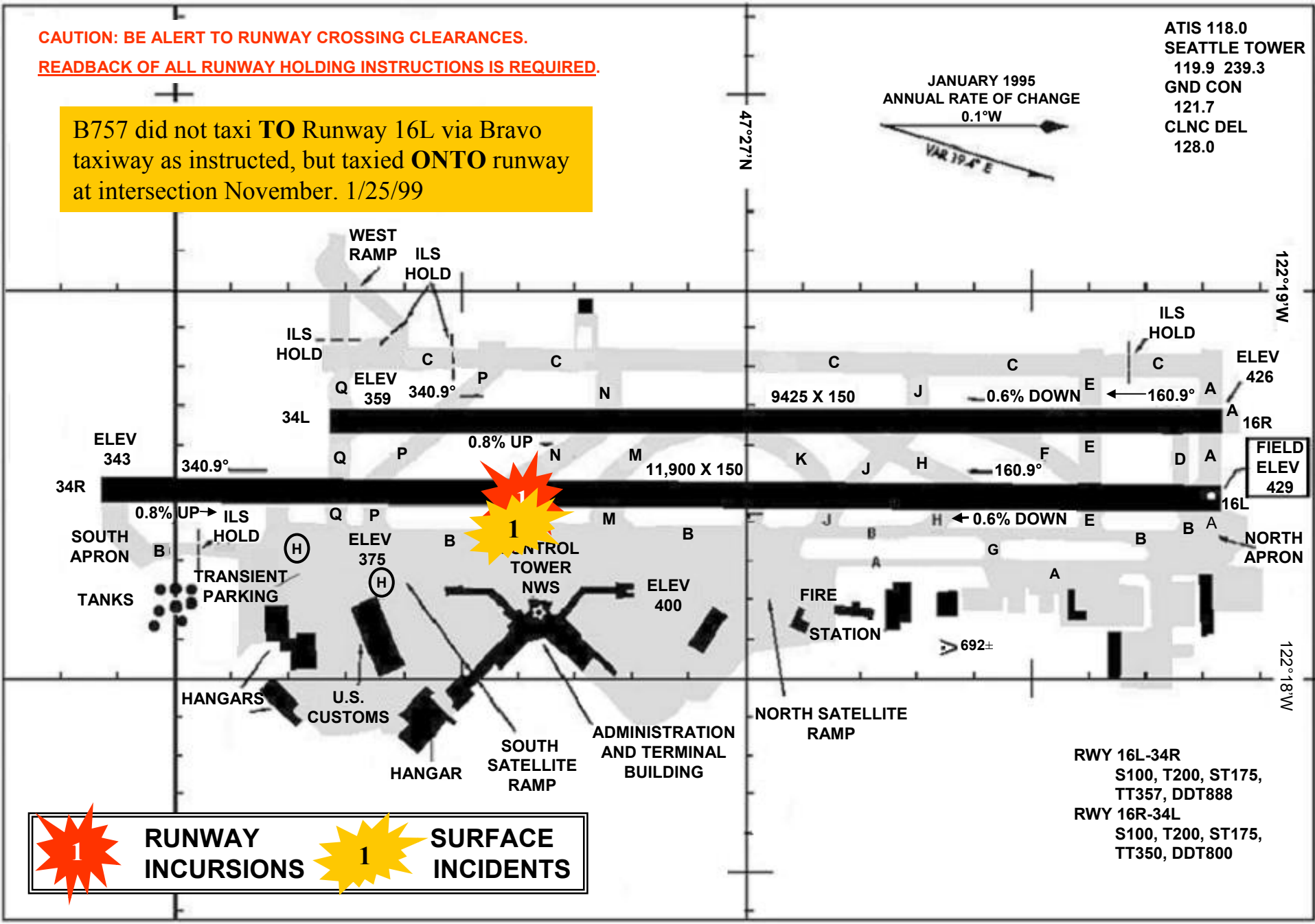

AIRCRAFT TAXIWAY
TOWER CLEARANCE REQUIRED

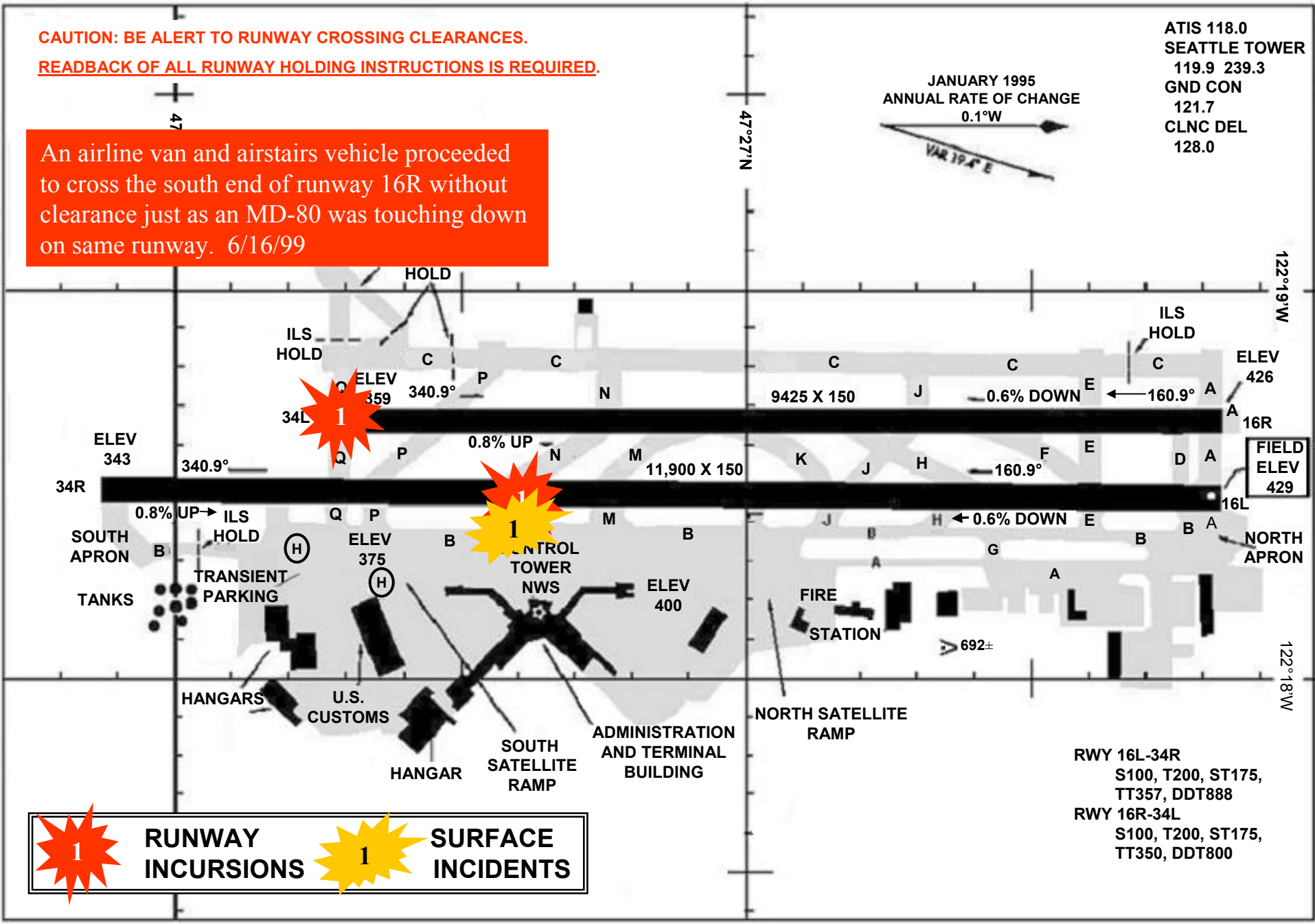
WHY HAVE A GROUND VEHICLE TRAINING PROGRAM?

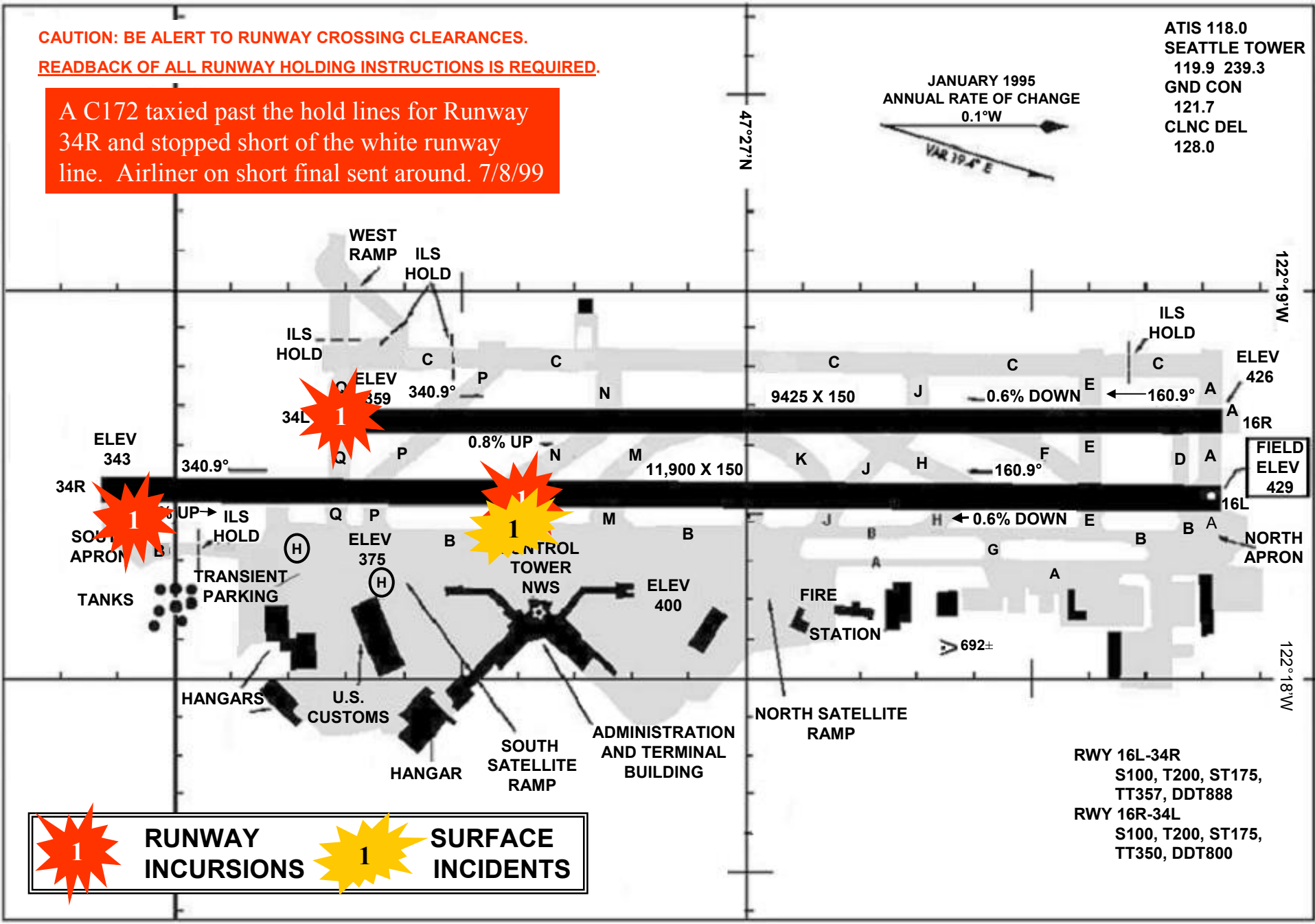
Sea-Tac International

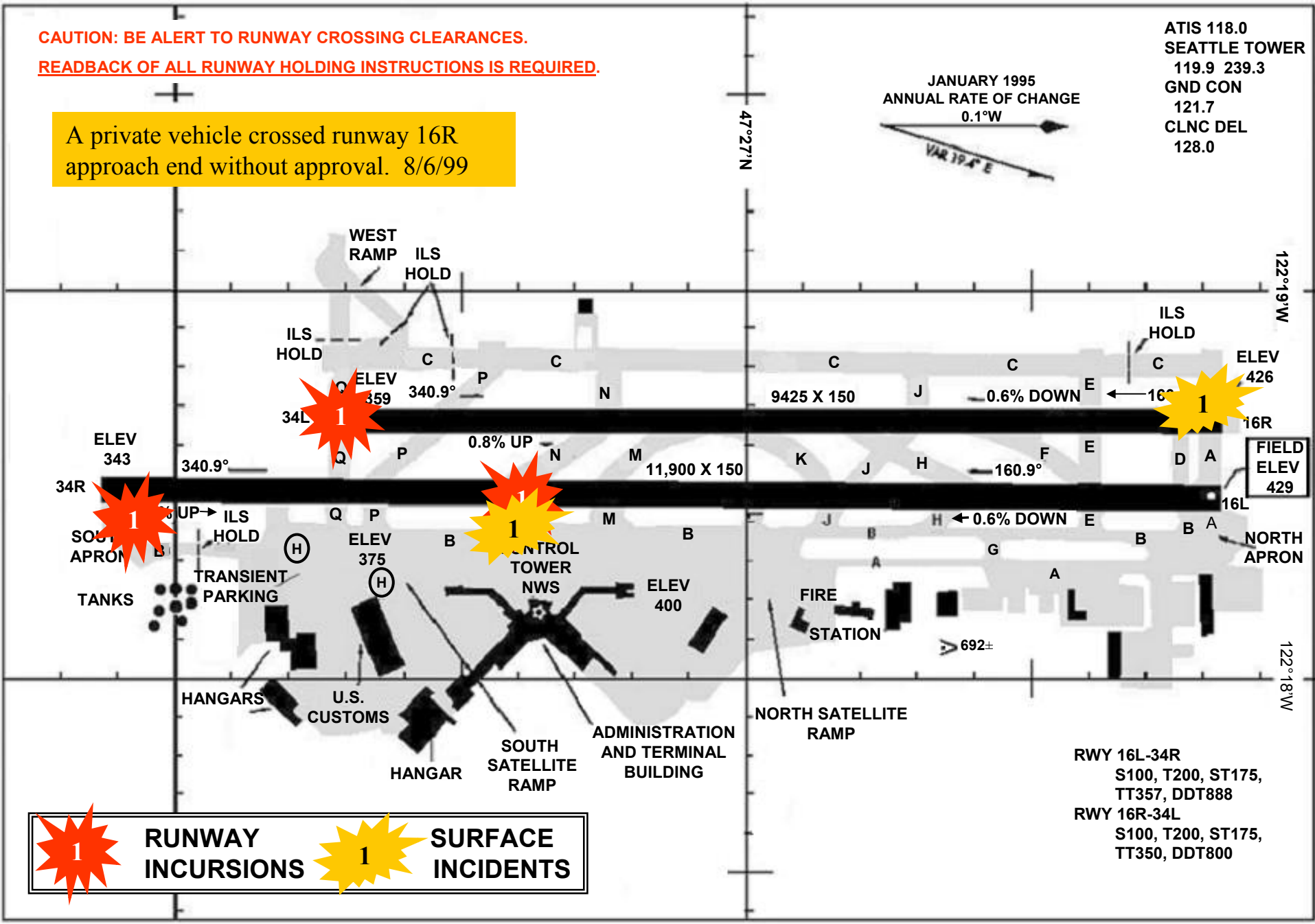


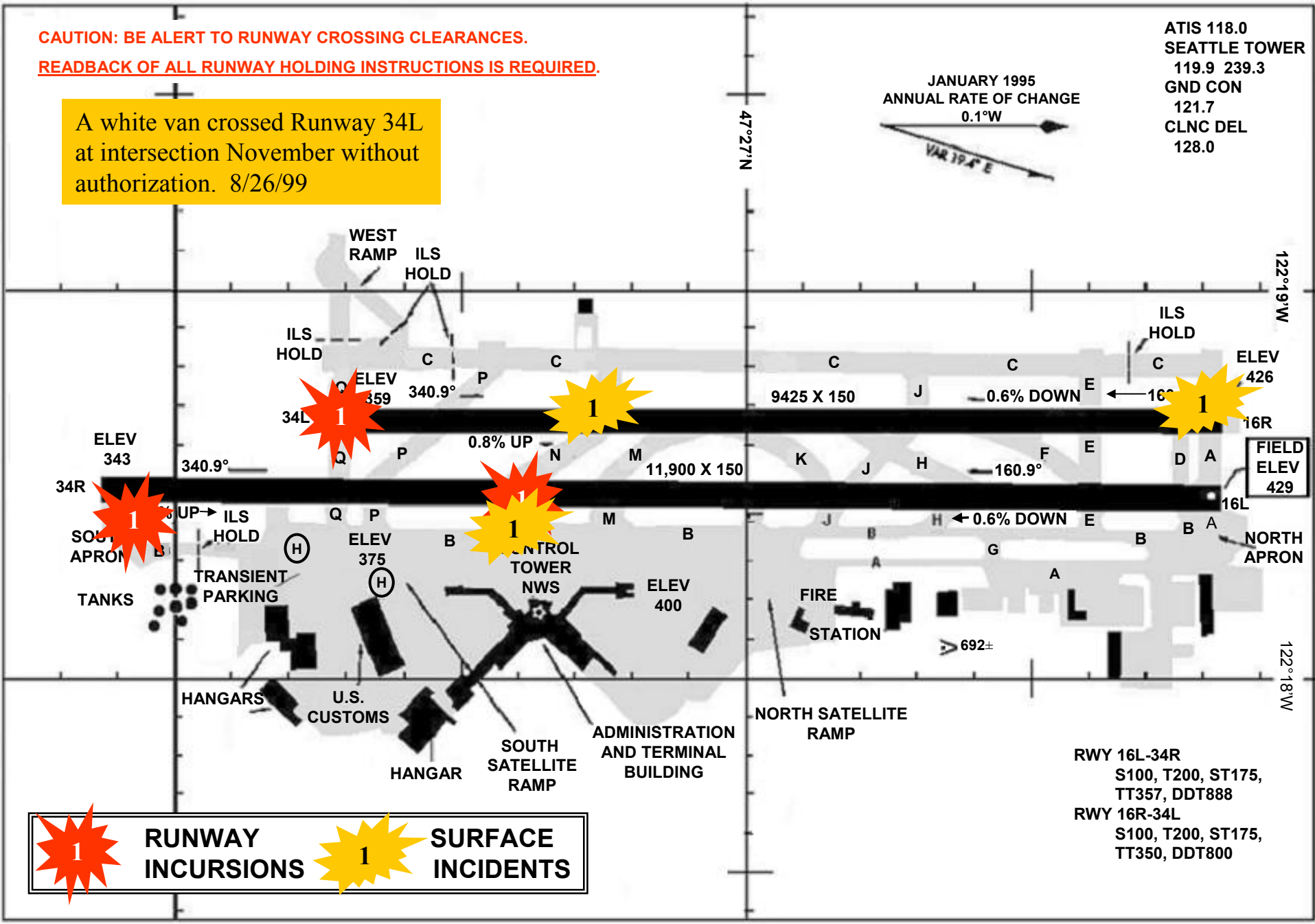

CAUTION: BE ALERT TO RUNWAY CROSSING CLEARANCES.
READBACK OF ALL RUNWAY HOLDING INSTRUCTIONS IS REQUIRED.
PA-31 was cleared to taxi into position on Runway 16L at November intersection when a DH-8 was on takeoff roll. 1/11/99
ATIS 118.0
SEATTLE TOWER
119.9 239.3
GND CON
121.7
CLNC DEL
128.0
JANUARY 1995
ANNUAL RATE OF CHANGE
0.1°W
VAR 19.4° E
47°27'N
122°19'W
122°18'W
WEST RAMP
ILS HOLD
ILS HOLD
ILS HOLD
ILS HOLD
ELEV 359
340.9°
ELEV 426
9425 X 150
0.6% DOWN
160.9°
34L
16R
ELEV 343
340.9°
0.8% UP
11,900 X 150
160.9°
FIELD ELEV 429
34R
16L
0.8% UP
ILS HOLD
0.6% DOWN
SOUTH APRON
TRANSIENT PARKING
TANKS
ELEV 375
CONTROL TOWER NWS
ELEV 400
FIRE STATION
692±
NORTH APRON
HANGARS
U.S. CUSTOMS
HANGAR
SOUTH SATELLITE RAMP
ADMINISTRATION AND TERMINAL BUILDING
NORTH SATELLITE RAMP
RWY 16L-34R
S100, T200, ST175,
TT357, DDT888
RWY 16R-34L
S100, T200, ST175,
TT350, DDT800
1 RUNWAY INCURSIONS
1 SURFACE INCIDENTS

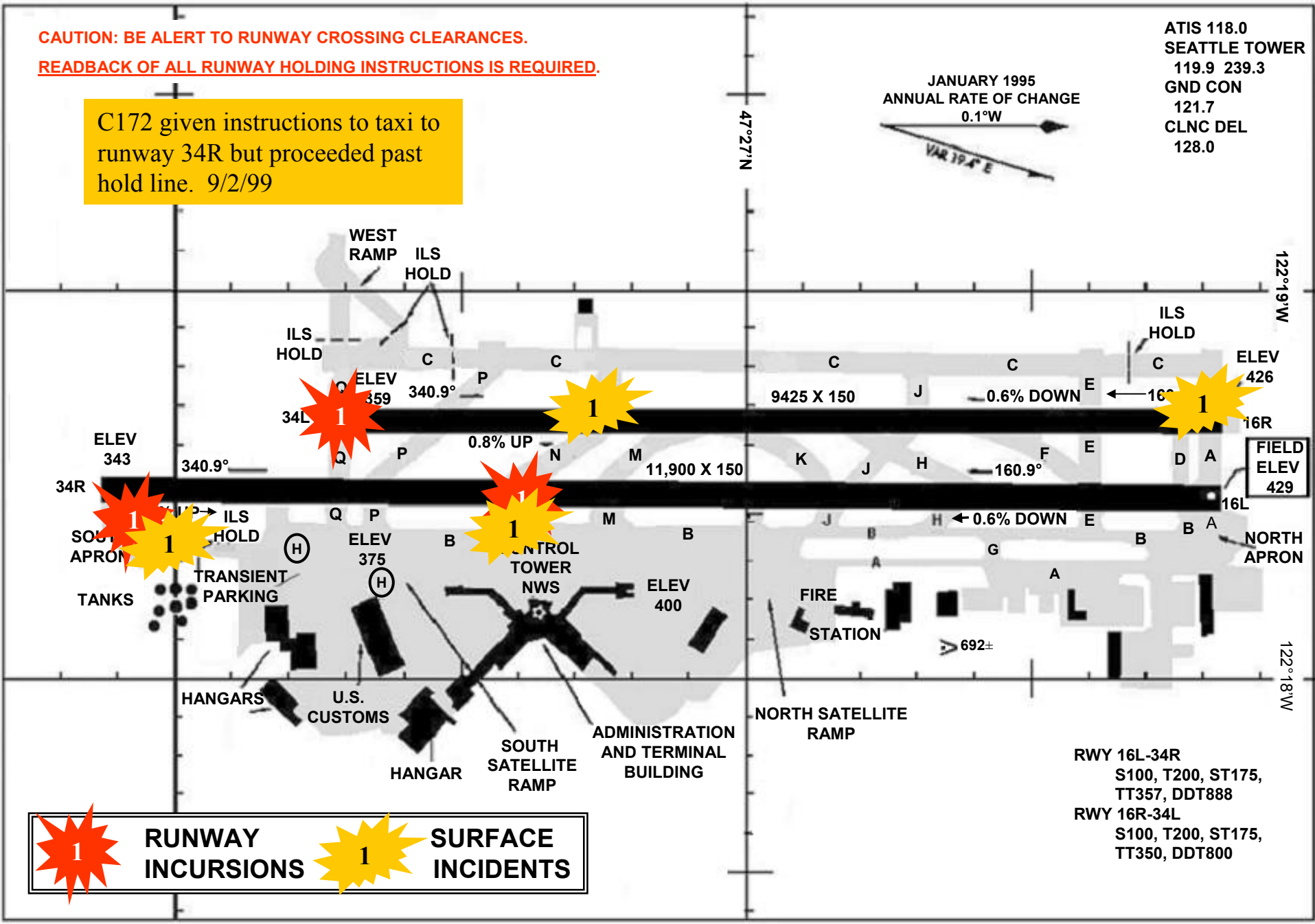

CAUTION: BE ALERT TO RUNWAY CROSSING CLEARANCES.
READBACK OF ALL RUNWAY HOLDING INSTRUCTIONS IS REQUIRED.
B757 did not taxi TO Runway 16L via Bravo taxiway as instructed, but taxied ONTO runway at intersection November. 1/25/99
ATIS 118.0
SEATTLE TOWER
119.9 239.3
GND CON
121.7
CLNC DEL
128.0
JANUARY 1995
ANNUAL RATE OF CHANGE
0.1°W
VAR 19.4° E
47°27'N
122°19'W
122°18'W
WEST RAMP
ILS HOLD
ILS HOLD
ILS HOLD
ILS HOLD
ELEV 359
340.9°
34L
ELEV 343
340.9°
34R
0.8% UP
0.8% UP
9425 X 150
0.6% DOWN
160.9°
ELEV 426
16R
11,900 X 150
160.9°
FIELD ELEV 429
16L
0.6% DOWN
SOUTH APRON
TRANSIENT PARKING
TANKS
ELEV 375
CONTROL TOWER
NWS
ELEV 400
FIRE STATION
692±
NORTH APRON
HANGARS
U.S. CUSTOMS
HANGAR
SOUTH SATELLITE RAMP
ADMINISTRATION AND TERMINAL BUILDING
NORTH SATELLITE RAMP
RWY 16L-34R
S100, T200, ST175,
TT357, DDT888
RWY 16R-34L
S100, T200, ST175,
TT350, DDT800
1 RUNWAY INCURSIONS
1 SURFACE INCIDENTS

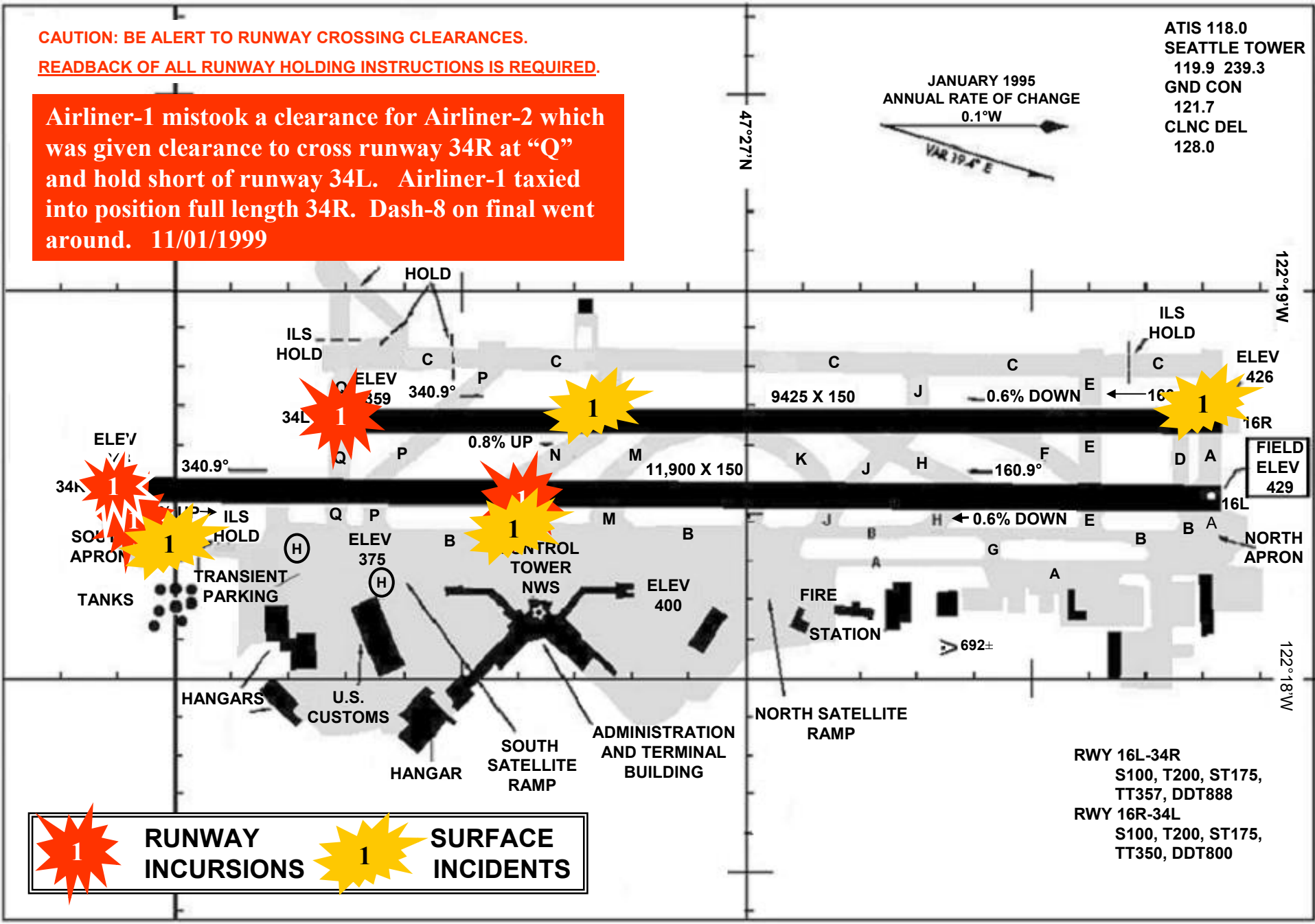

CAUTION: BE ALERT TO RUNWAY CROSSING CLEARANCES.
READBACK OF ALL RUNWAY HOLDING INSTRUCTIONS IS REQUIRED.
An airline van and airstairs vehicle proceeded to cross the south end of runway 16R without clearance just as an MD-80 was touching down on same runway. 6/16/99
ATIS 118.0
SEATTLE TOWER
119.9 239.3
GND CON
121.7
CLNC DEL
128.0
JANUARY 1995
ANNUAL RATE OF CHANGE
0.1°W
VAR 19.4° E
47°27'N
122°19'W
122°18'W
HOLD
ILS
HOLD
ELEV
426
16R
34L
ELEV
343
340.9°
0.8% UP
9425 X 150
0.6% DOWN
160.9°
11,900 X 150
34R
16L
FIELD
ELEV
429
SOUTH
APRON
TANKS
TRANSIENT
PARKING
ELEV
375
TOWER
NWS
ELEV
400
FIRE
STATION
692±
NORTH
APRON
HANGARS
U.S.
CUSTOMS
HANGAR
SOUTH
SATELLITE
RAMP
ADMINISTRATION
AND TERMINAL
BUILDING
NORTH SATELLITE
RAMP
RWY 16L-34R
S100, T200, ST175,
TT357, DDT888
RWY 16R-34L
S100, T200, ST175,
TT350, DDT800
1
RUNWAY
INCURSIONS
1
SURFACE
INCIDENTS

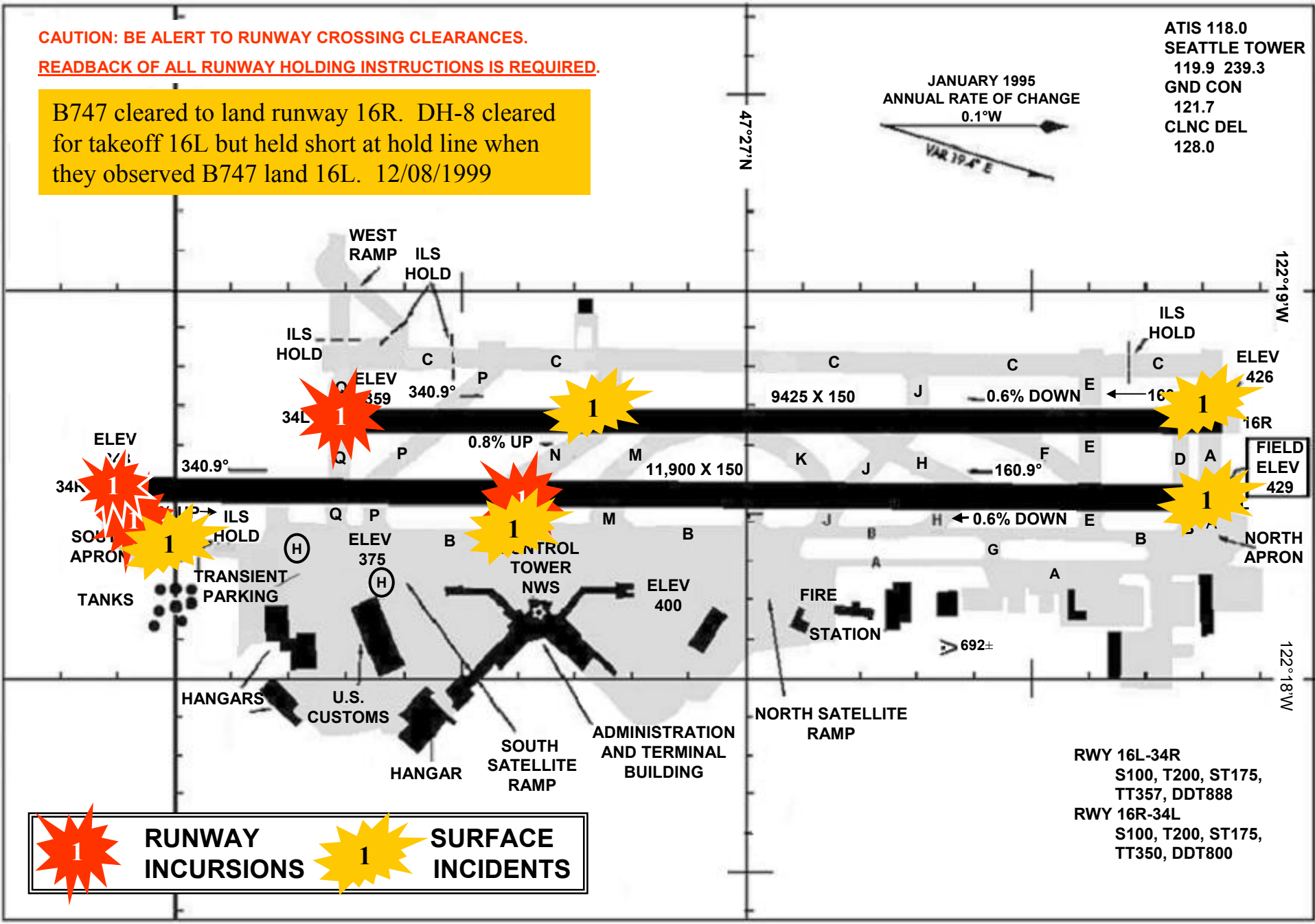

CAUTION: BE ALERT TO RUNWAY CROSSING CLEARANCES.
READBACK OF ALL RUNWAY HOLDING INSTRUCTIONS IS REQUIRED.
A C172 taxied past the hold lines for Runway 34R and stopped short of the white runway line. Airliner on short final sent around. 7/8/99
ATIS 118.0
SEATTLE TOWER
119.9 239.3
GND CON
121.7
CLNC DEL
128.0
JANUARY 1995
ANNUAL RATE OF CHANGE
0.1°W
VAR 19.4° E
47°27'N
122°19'W
122°18'W
WEST RAMP
ILS HOLD
ILS HOLD
ELEV 426
16R
FIELD ELEV 429
16L
ELEV 343
34R
340.9°
34L
ELEV 359
340.9°
0.8% UP
11,900 X 150
9425 X 150
0.6% DOWN
160.9°
0.6% DOWN
ILS HOLD
TRANSIENT PARKING
ELEV 375
TOWER
NWS
ELEV 400
TANKS
FIRE STATION
692±
NORTH APRON
HANGARS
U.S. CUSTOMS
HANGAR
SOUTH SATELLITE RAMP
ADMINISTRATION AND TERMINAL BUILDING
NORTH SATELLITE RAMP
RWY 16L-34R
S100, T200, ST175,
TT357, DDT888
RWY 16R-34L
S100, T200, ST175,
TT350, DDT800
1
RUNWAY INCURSIONS
1
SURFACE INCIDENTS

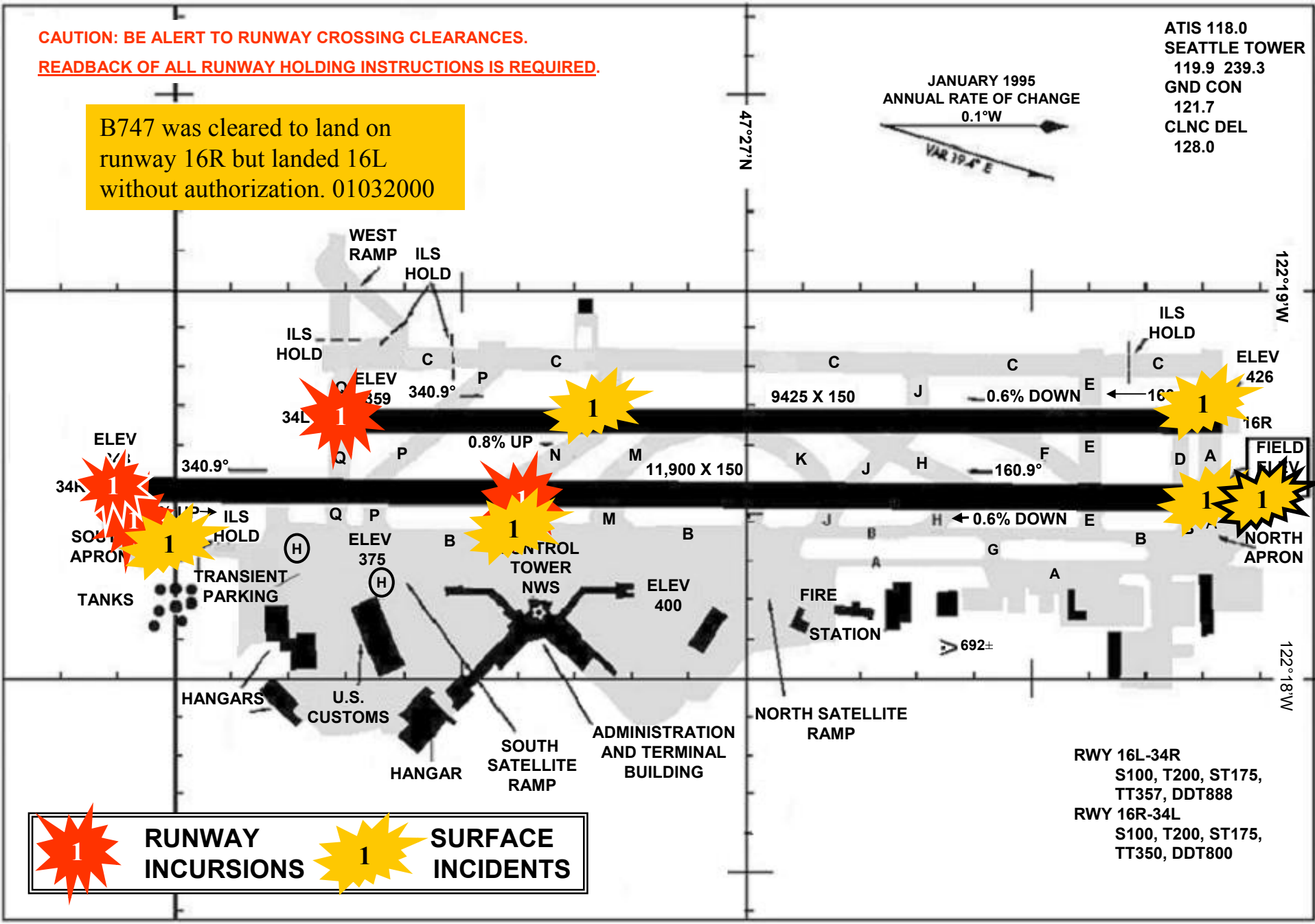

CAUTION: BE ALERT TO RUNWAY CROSSING CLEARANCES.
READBACK OF ALL RUNWAY HOLDING INSTRUCTIONS IS REQUIRED.
A private vehicle crossed runway 16R approach end without approval. 8/6/99
ATIS 118.0
SEATTLE TOWER
119.9 239.3
GND CON
121.7
CLNC DEL
128.0
JANUARY 1995
ANNUAL RATE OF CHANGE
0.1°W
VAR 19.4° E
47°27'N
122°19'W
122°18'W
WEST RAMP
ILS HOLD
ILS HOLD
ILS HOLD
ILS HOLD
ELEV 426
ELEV 343
ELEV 375
ELEV 400
340.9°
340.9°
160.9°
9425 X 150
11,900 X 150
0.6% DOWN
0.6% DOWN
0.8% UP
34L
34R
16R
16L
FIELD ELEV 429
TRANSIENT PARKING
TANKS
NORTH APRON
FIRE STATION
692±
HANGARS
U.S. CUSTOMS
HANGAR
SOUTH SATELLITE RAMP
ADMINISTRATION AND TERMINAL BUILDING
NORTH SATELLITE RAMP
RWY 16L-34R
S100, T200, ST175,
TT357, DDT888
RWY 16R-34L
S100, T200, ST175,
TT350, DDT800
1 RUNWAY INCURSIONS
1 SURFACE INCIDENTS

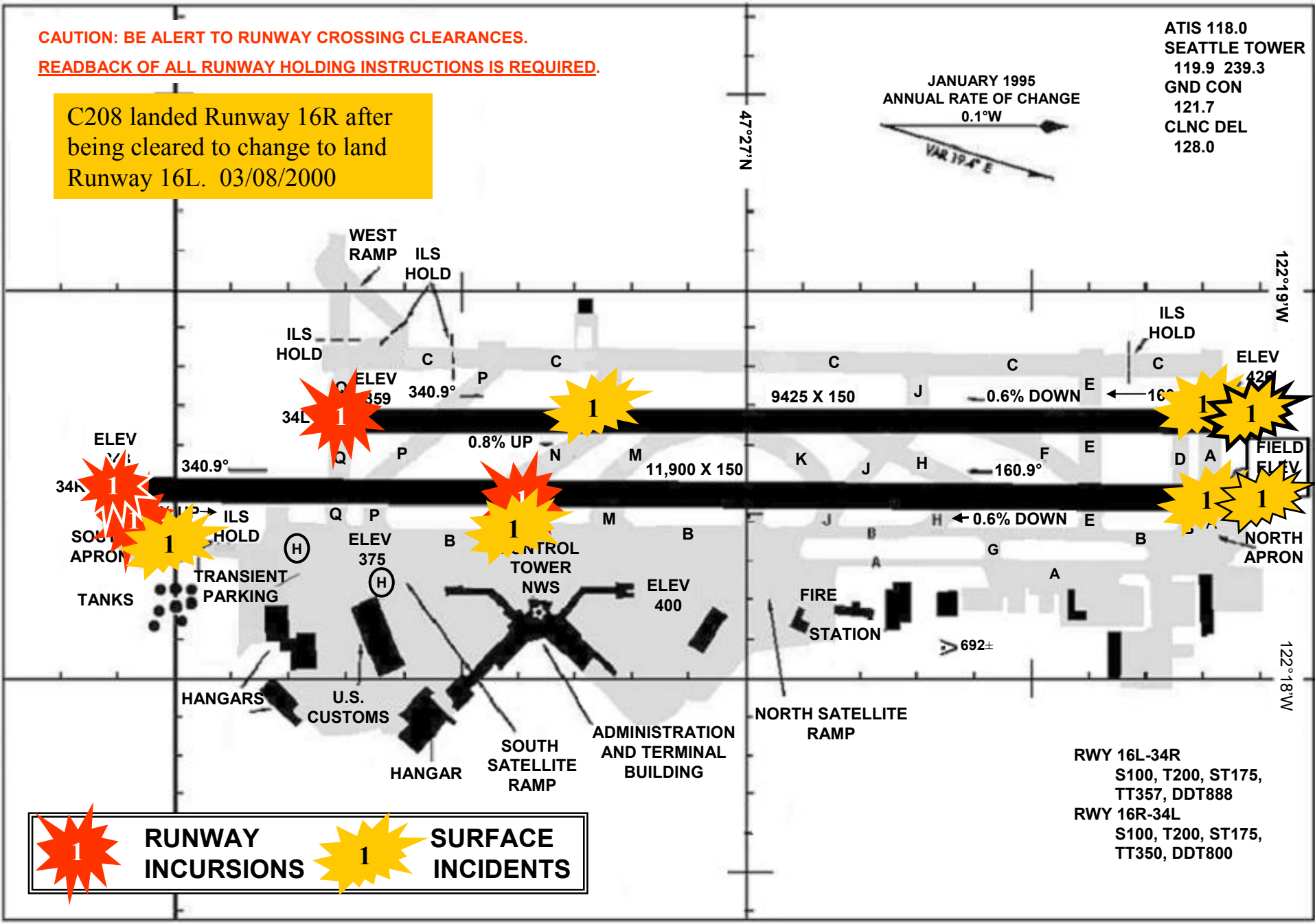

CAUTION: BE ALERT TO RUNWAY CROSSING CLEARANCES.
READBACK OF ALL RUNWAY HOLDING INSTRUCTIONS IS REQUIRED.
A white van crossed Runway 34L at intersection November without authorization. 8/26/99
ATIS 118.0
SEATTLE TOWER
119.9 239.3
GND CON
121.7
CLNC DEL
128.0
JANUARY 1995
ANNUAL RATE OF CHANGE
0.1°W
VAR 19.4° E
47°27'N
122°19'W
122°18'W
WEST RAMP
ILS HOLD
ILS HOLD
ILS HOLD
ILS HOLD
ELEV 426
ELEV 343
ELEV 375
ELEV 400
340.9°
340.9°
160.9°
9425 X 150
11,900 X 150
0.6% DOWN
0.6% DOWN
0.8% UP
34L
34R
16R
16L
FIELD ELEV 429
TRANSIENT PARKING
TANKS
CONTROL TOWER
NWS
FIRE STATION
692±
NORTH APRON
HANGARS
U.S. CUSTOMS
HANGAR
SOUTH SATELLITE RAMP
ADMINISTRATION AND TERMINAL BUILDING
NORTH SATELLITE RAMP
RWY 16L-34R
S100, T200, ST175,
TT357, DDT888
RWY 16R-34L
S100, T200, ST175,
TT350, DDT800
1 RUNWAY INCURSIONS
1 SURFACE INCIDENTS

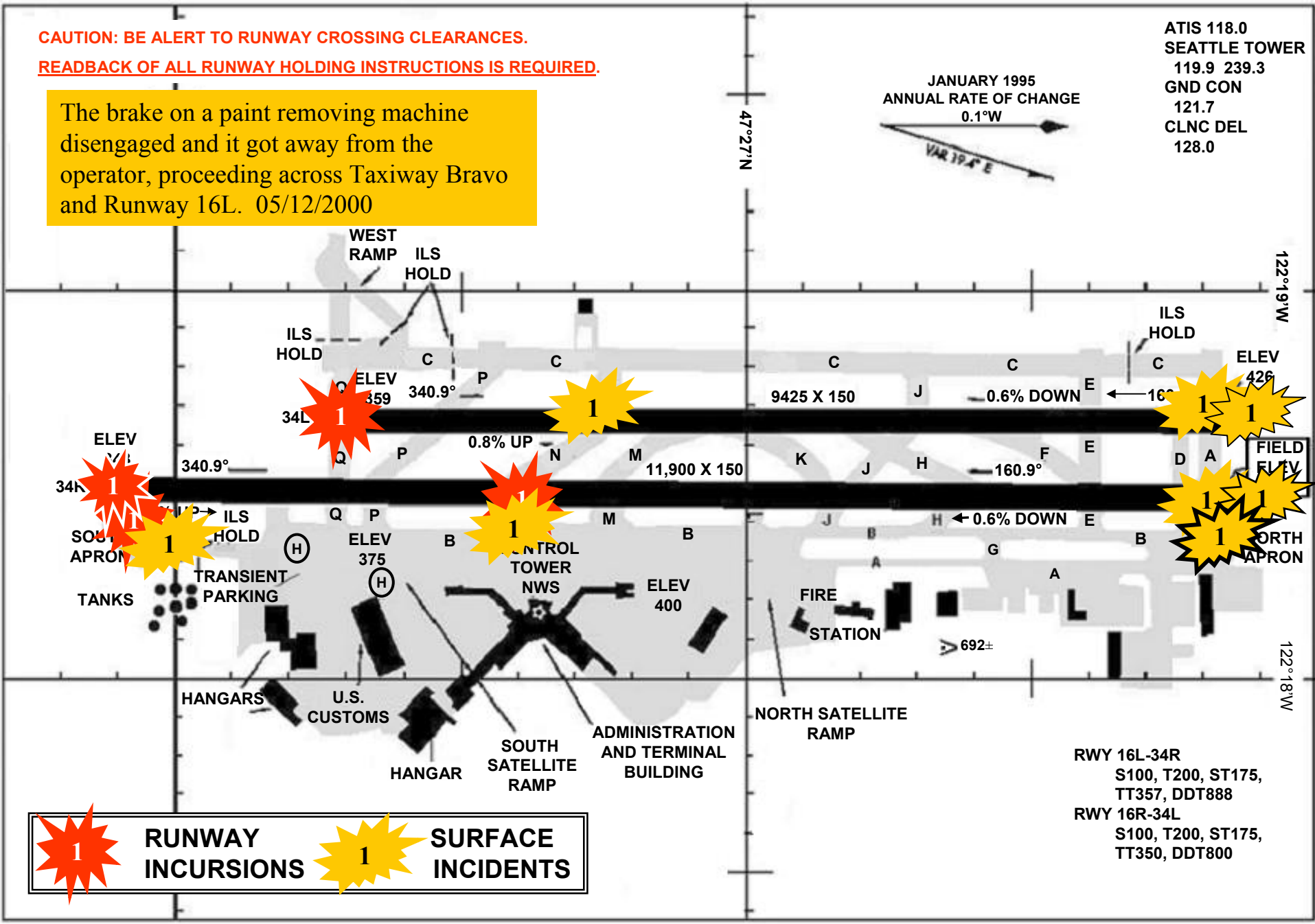

CAUTION: BE ALERT TO RUNWAY CROSSING CLEARANCES.
READBACK OF ALL RUNWAY HOLDING INSTRUCTIONS IS REQUIRED.
C172 given instructions to taxi to runway 34R but proceeded past hold line. 9/2/99
ATIS 118.0
SEATTLE TOWER
119.9 239.3
GND CON
121.7
CLNC DEL
128.0
JANUARY 1995
ANNUAL RATE OF CHANGE
0.1°W
VAR 19.4° E
47°27'N
122°19'W
122°18'W
WEST RAMP
ILS HOLD
ILS HOLD
ELEV 426
9425 X 150
0.6% DOWN
16R
ELEV 343
340.9°
0.8% UP
11,900 X 150
160.9°
FIELD ELEV 429
34R
16L
ILS HOLD
0.6% DOWN
NORTH APRON
SOUTH APRON
TRANSIENT PARKING
ELEV 375
TOWER NWS
ELEV 400
TANKS
FIRE STATION
692±
HANGARS
U.S. CUSTOMS
HANGAR
SOUTH SATELLITE RAMP
ADMINISTRATION AND TERMINAL BUILDING
NORTH SATELLITE RAMP
RWY 16L-34R
S100, T200, ST175,
TT357, DDT888
RWY 16R-34L
S100, T200, ST175,
TT350, DDT800
RUNWAY INCURSIONS
SURFACE INCIDENTS


CAUTION: BE ALERT TO RUNWAY CROSSING CLEARANCES.
READBACK OF ALL RUNWAY HOLDING INSTRUCTIONS IS REQUIRED.
Airliner-1 mistook a clearance for Airliner-2 which was given clearance to cross runway 34R at "Q" and hold short of runway 34L. Airliner-1 taxied into position full length 34R. Dash-8 on final went around. 11/01/1999
ATIS 118.0
SEATTLE TOWER
119.9 239.3
GND CON
121.7
CLNC DEL
128.0
JANUARY 1995
ANNUAL RATE OF CHANGE
0.1°W
VAR 19.4° E
47°27'N
122°19'W
122°18'W
HOLD
ILS
HOLD
ELEV
340.9°
34L
0.8% UP
9425 X 150
0.6% DOWN
ELEV
426
16R
340.9°
11,900 X 150
160.9°
FIELD
ELEV
429
16L
ILS
HOLD
0.6% DOWN
NORTH
APRON
SOUTH
APRON
TANKS
TRANSIENT
PARKING
ELEV
375
CONTROL
TOWER
NWS
ELEV
400
FIRE
STATION
692±
HANGARS
U.S.
CUSTOMS
HANGAR
SOUTH
SATELLITE
RAMP
ADMINISTRATION
AND TERMINAL
BUILDING
NORTH SATELLITE
RAMP
RWY 16L-34R
S100, T200, ST175,
TT357, DDT888
RWY 16R-34L
S100, T200, ST175,
TT350, DDT800
1 RUNWAY INCURSIONS
1 SURFACE INCIDENTS


CAUTION: BE ALERT TO RUNWAY CROSSING CLEARANCES.
READBACK OF ALL RUNWAY HOLDING INSTRUCTIONS IS REQUIRED.
B747 cleared to land runway 16R. DH-8 cleared for takeoff 16L but held short at hold line when they observed B747 land 16L. 12/08/1999
ATIS 118.0
SEATTLE TOWER
119.9 239.3
GND CON
121.7
CLNC DEL
128.0
JANUARY 1995
ANNUAL RATE OF CHANGE
0.1°W
VAR 19.4° E
47°27'N
122°19'W
122°18'W
WEST RAMP
ILS HOLD
ILS HOLD
ILS HOLD
ILS HOLD
ELEV 426
9425 X 150
0.6% DOWN
16R
FIELD ELEV 429
0.8% UP
11,900 X 150
160.9°
340.9°
0.6% DOWN
NORTH APRON
SOUTH APRON
TANKS
TRANSIENT PARKING
ELEV 375
CONTROL TOWER
NWS
ELEV 400
FIRE STATION
692±
HANGARS
U.S. CUSTOMS
HANGAR
SOUTH SATELLITE RAMP
ADMINISTRATION AND TERMINAL BUILDING
NORTH SATELLITE RAMP
RWY 16L-34R
S100, T200, ST175,
TT357, DDT888
RWY 16R-34L
S100, T200, ST175,
TT350, DDT800
RUNWAY INCURSIONS
SURFACE INCIDENTS


CAUTION: BE ALERT TO RUNWAY CROSSING CLEARANCES.
READBACK OF ALL RUNWAY HOLDING INSTRUCTIONS IS REQUIRED.
B747 was cleared to land on runway 16R but landed 16L without authorization. 01032000
ATIS 118.0
SEATTLE TOWER
119.9 239.3
GND CON
121.7
CLNC DEL
128.0
JANUARY 1995
ANNUAL RATE OF CHANGE
0.1°W
VAR 19.4° E
47°27'N
122°19'W
122°18'W
WEST RAMP
ILS HOLD
ILS HOLD
ILS HOLD
ILS HOLD
ELEV 426
ELEV 359
340.9°
34L
16R
9425 X 150
0.6% DOWN
0.8% UP
340.9°
11,900 X 150
160.9°
0.6% DOWN
FIELD ELEV
ELEV
34R
SOUTH APRON
NORTH APRON
TANKS
TRANSIENT PARKING
ELEV 375
CONTROL TOWER
NWS
ELEV 400
FIRE STATION
692±
HANGARS
U.S. CUSTOMS
HANGAR
SOUTH SATELLITE RAMP
ADMINISTRATION AND TERMINAL BUILDING
NORTH SATELLITE RAMP
RWY 16L-34R
S100, T200, ST175,
TT357, DDT888
RWY 16R-34L
S100, T200, ST175,
TT350, DDT800
RUNWAY INCURSIONS
SURFACE INCIDENTS

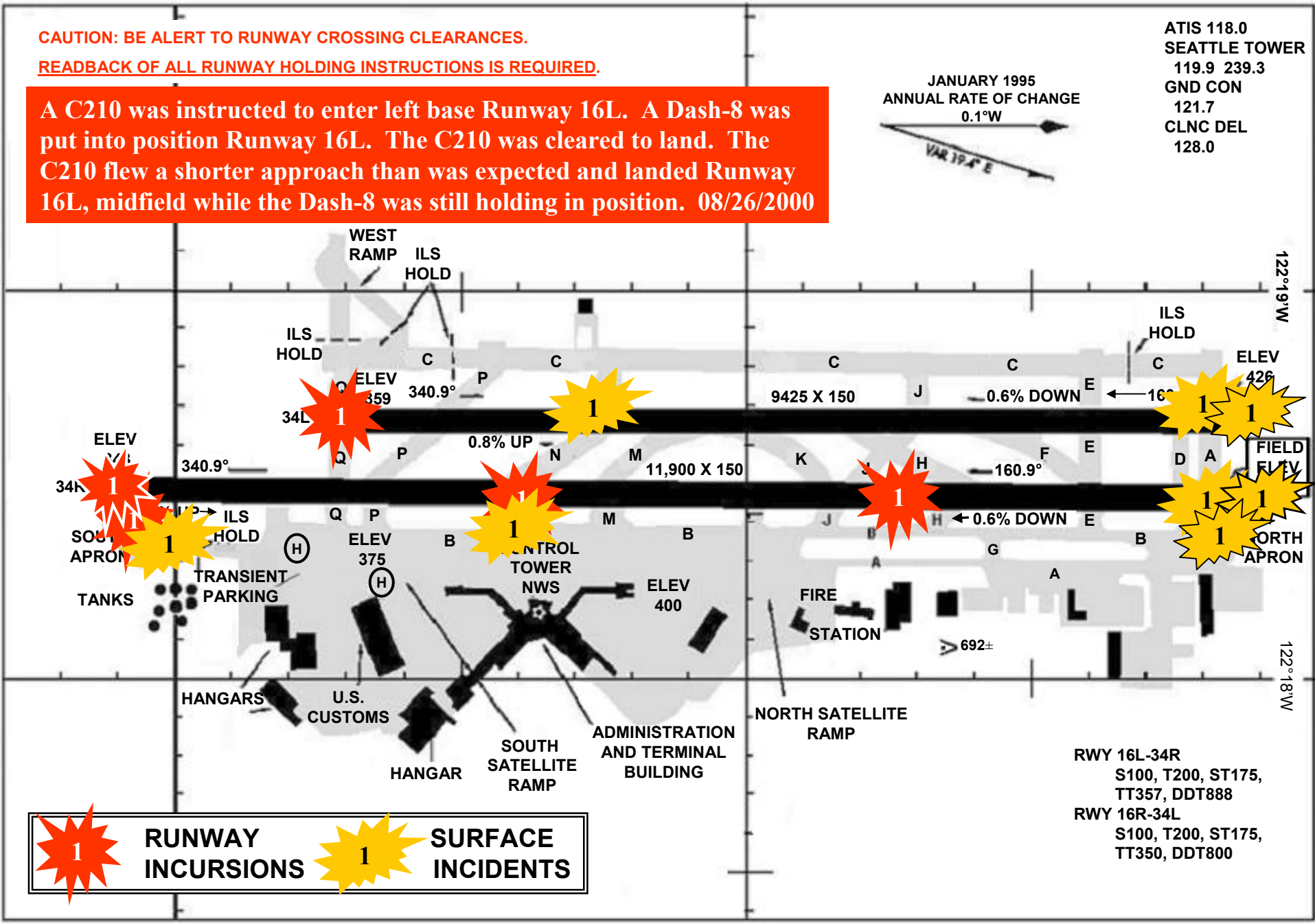

CAUTION: BE ALERT TO RUNWAY CROSSING CLEARANCES.
READBACK OF ALL RUNWAY HOLDING INSTRUCTIONS IS REQUIRED.
C208 landed Runway 16R after being cleared to change to land Runway 16L. 03/08/2000
ATIS 118.0
SEATTLE TOWER
119.9 239.3
GND CON
121.7
CLNC DEL
128.0
JANUARY 1995
ANNUAL RATE OF CHANGE
0.1°W
VAR 19.4° E
47°27'N
122°19'W
122°18'W
WEST RAMP
ILS HOLD
ELEV 359
340.9°
34L
0.8% UP
9425 X 150
0.6% DOWN
160.9°
11,900 X 150
ELEV 420
FIELD ELEV
NORTH APRON
SOUTH APRON
TANKS
TRANSIENT PARKING
ELEV 375
CONTROL TOWER
NWS
ELEV 400
FIRE STATION
692±
HANGARS
U.S. CUSTOMS
HANGAR
SOUTH SATELLITE RAMP
ADMINISTRATION AND TERMINAL BUILDING
NORTH SATELLITE RAMP
RWY 16L-34R
S100, T200, ST175,
TT357, DDT888
RWY 16R-34L
S100, T200, ST175,
TT350, DDT800
RUNWAY INCURSIONS
SURFACE INCIDENTS

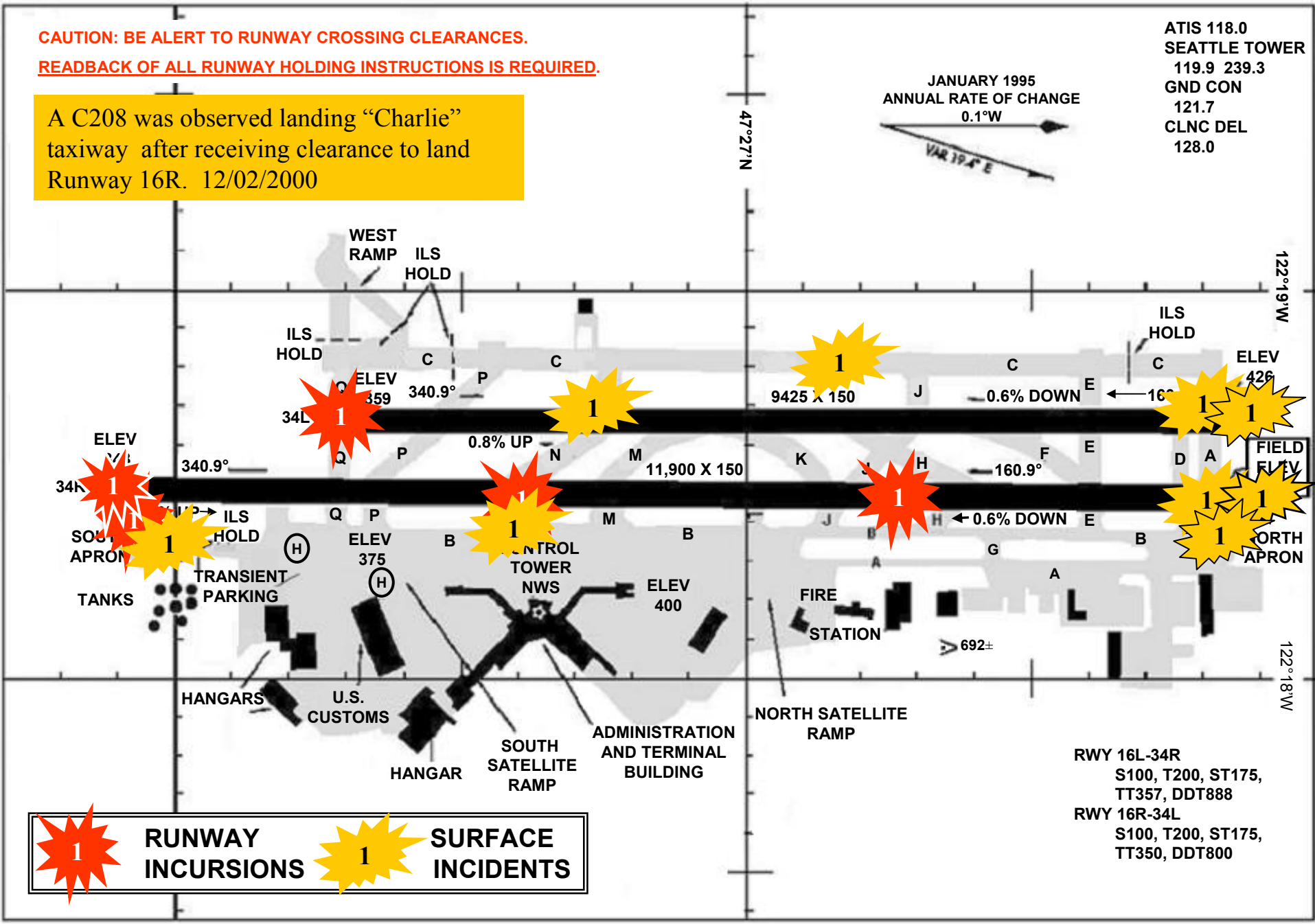

CAUTION: BE ALERT TO RUNWAY CROSSING CLEARANCES.
READBACK OF ALL RUNWAY HOLDING INSTRUCTIONS IS REQUIRED.
The brake on a paint removing machine disengaged and it got away from the operator, proceeding across Taxiway Bravo and Runway 16L. 05/12/2000
ATIS 118.0
SEATTLE TOWER
119.9 239.3
GND CON
121.7
CLNC DEL
128.0
JANUARY 1995
ANNUAL RATE OF CHANGE
0.1°W
VAR 19.4° E
47°27'N
122°19'W
122°18'W
WEST RAMP
ILS HOLD
ILS HOLD
ILS HOLD
ILS HOLD
ELEV 426
9425 X 150
0.6% DOWN
0.8% UP
11,900 X 150
160.9°
340.9°
0.6% DOWN
FIELD ELEV
ELEV 375
ELEV 400
TRANSIENT PARKING
TANKS
CONTROL TOWER
NWS
FIRE STATION
692±
HANGARS
U.S. CUSTOMS
HANGAR
SOUTH SATELLITE RAMP
ADMINISTRATION AND TERMINAL BUILDING
NORTH SATELLITE RAMP
RWY 16L-34R
S100, T200, ST175,
TT357, DDT888
RWY 16R-34L
S100, T200, ST175,
TT350, DDT800
RUNWAY INCURSIONS
SURFACE INCIDENTS

CAUTION: BE ALERT TO RUNWAY CROSSING CLEARANCES.

READBACK OF ALL RUNWAY HOLDING INSTRUCTIONS IS REQUIRED.

A C210 was instructed to enter left base Runway 16L. A Dash-8 was put into position Runway 16L. The C210 was cleared to land. The C210 flew a shorter approach than was expected and landed Runway 16L, midfield while the Dash-8 was still holding in position. 08/26/2000

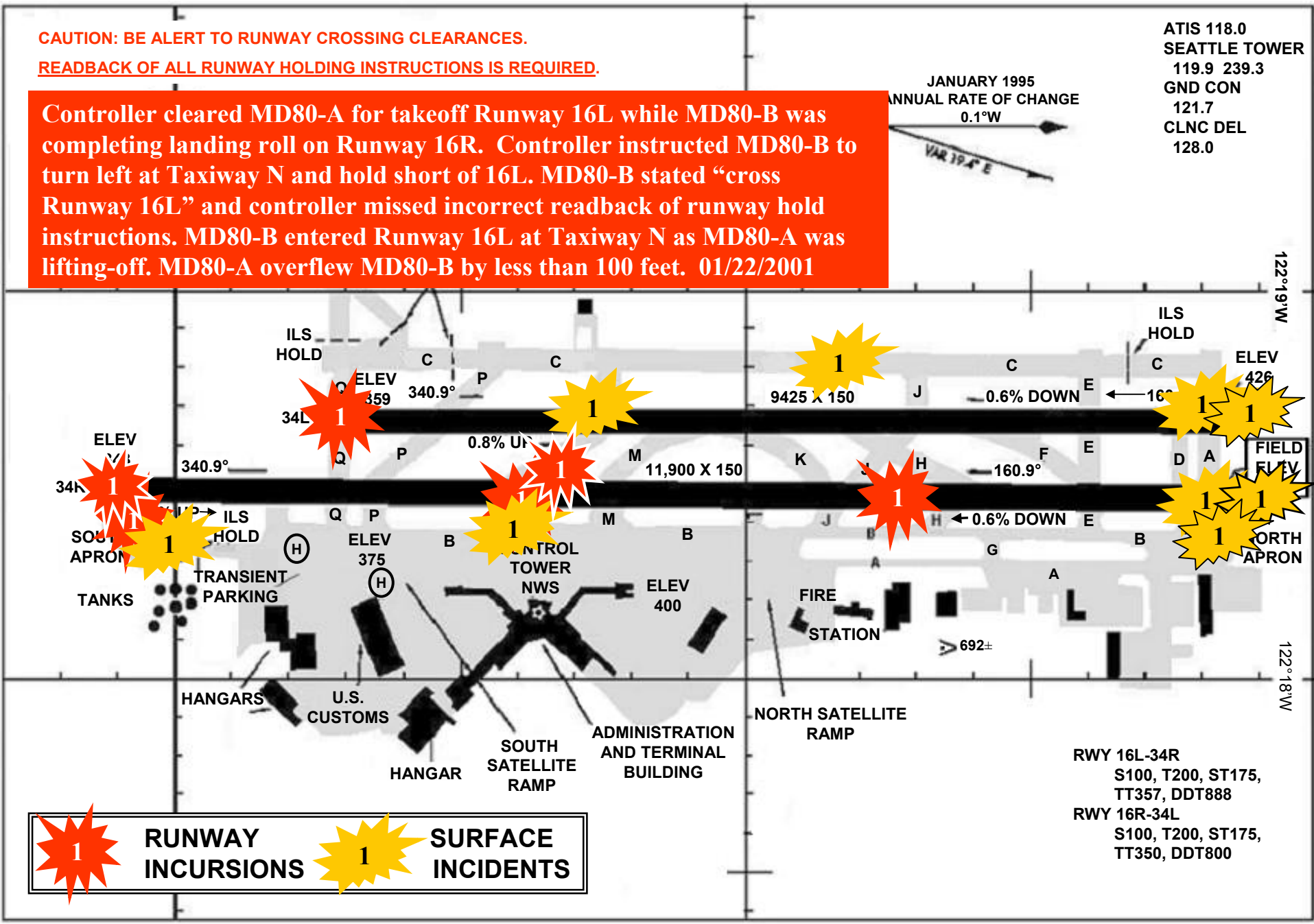


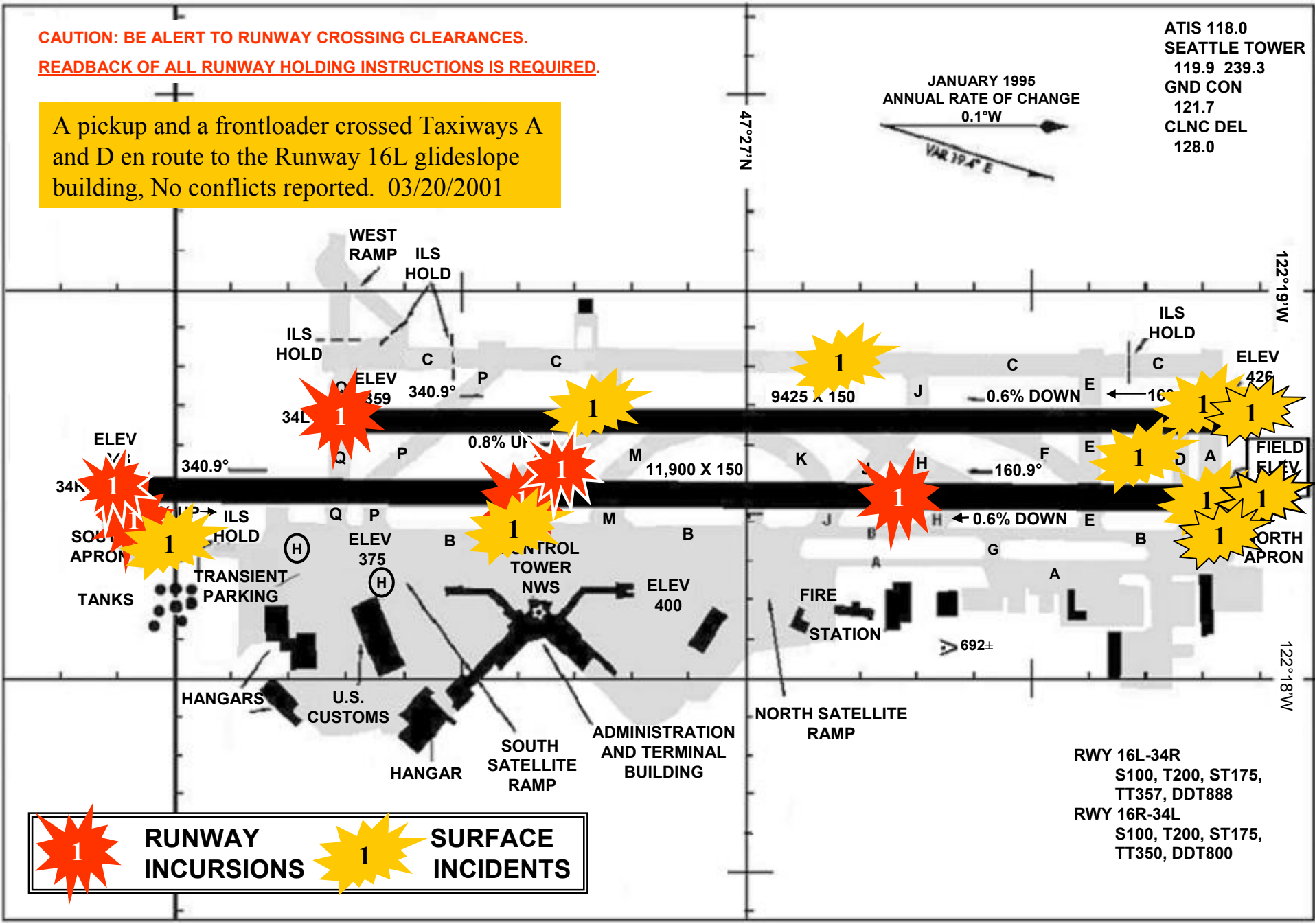

CAUTION: BE ALERT TO RUNWAY CROSSING CLEARANCES.
READBACK OF ALL RUNWAY HOLDING INSTRUCTIONS IS REQUIRED.
A C208 was observed landing "Charlie" taxiway after receiving clearance to land Runway 16R. 12/02/2000
ATIS 118.0
SEATTLE TOWER
119.9 239.3
GND CON
121.7
CLNC DEL
128.0
JANUARY 1995
ANNUAL RATE OF CHANGE
0.1°W
VAR 19.4° E
47°27'N
122°19'W
122°18'W
WEST RAMP
ILS HOLD
ILS HOLD
ILS HOLD
ILS HOLD
ELEV 426
ELEV 359
340.9°
34L
0.8% UP
9425 X 150
0.6% DOWN
160.9°
11,900 X 150
0.6% DOWN
FIELD ELEV
ELEV
34R
SOUTH APRON
NORTH APRON
TANKS
TRANSIENT PARKING
ELEV 375
CONTROL TOWER NWS
ELEV 400
FIRE STATION
692±
HANGARS
U.S. CUSTOMS
HANGAR
SOUTH SATELLITE RAMP
ADMINISTRATION AND TERMINAL BUILDING
NORTH SATELLITE RAMP
RWY 16L-34R
S100, T200, ST175,
TT357, DDT888
RWY 16R-34L
S100, T200, ST175,
TT350, DDT800
RUNWAY INCURSIONS
SURFACE INCIDENTS

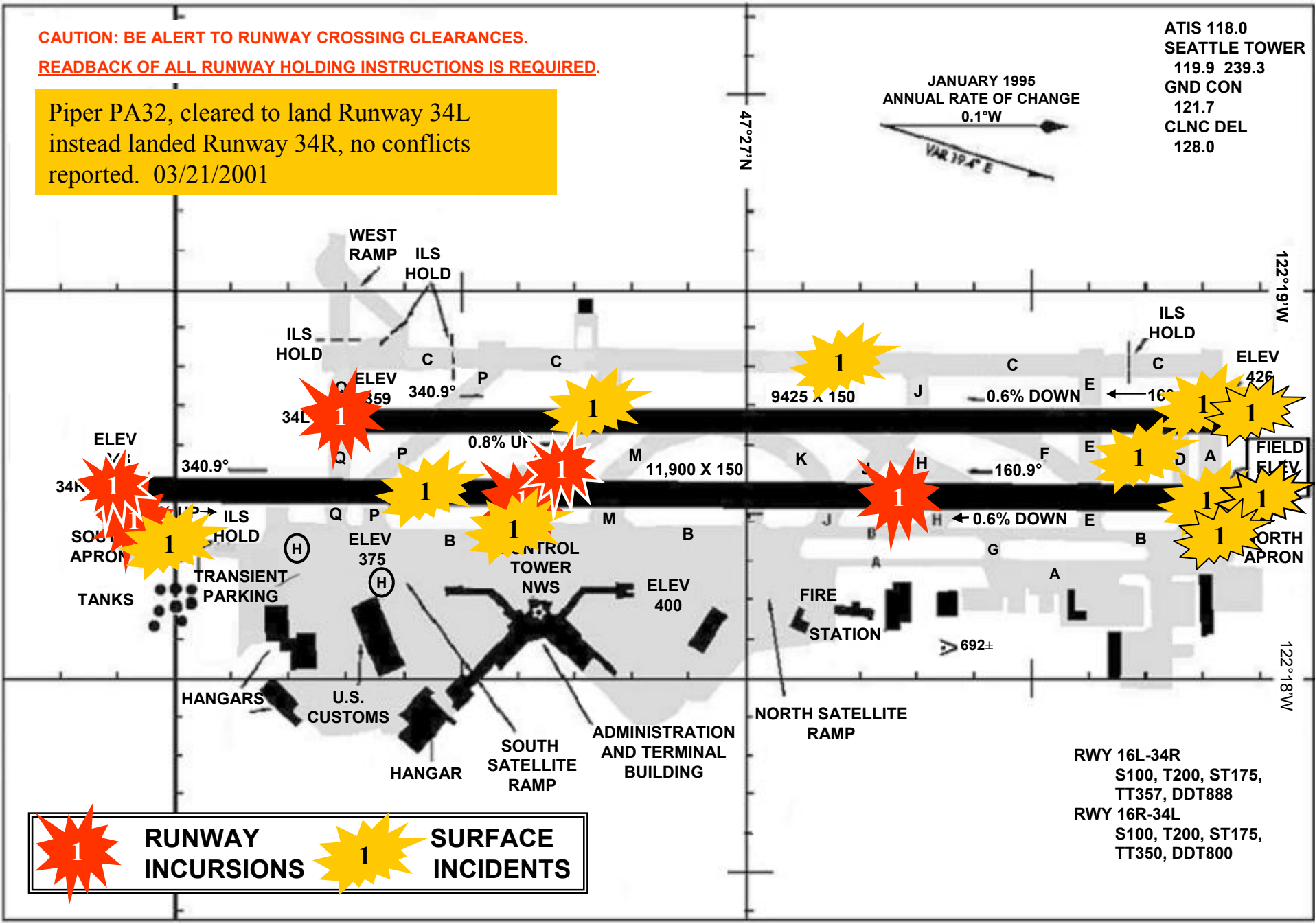
CAUTION: BE ALERT TO RUNWAY CROSSING CLEARANCES.

READBACK OF ALL RUNWAY HOLDING INSTRUCTIONS IS REQUIRED.

Controller cleared MD80-A for takeoff Runway 16L while MD80-B was completing landing roll on Runway 16R. Controller instructed MD80-B to turn left at Taxiway N and hold short of 16L. MD80-B stated "cross Runway 16L" and controller missed incorrect readback of runway hold instructions. MD80-B entered Runway 16L at Taxiway N as MD80-A was lifting-off. MD80-A overflew MD80-B by less than 100 feet. 01/22/2001



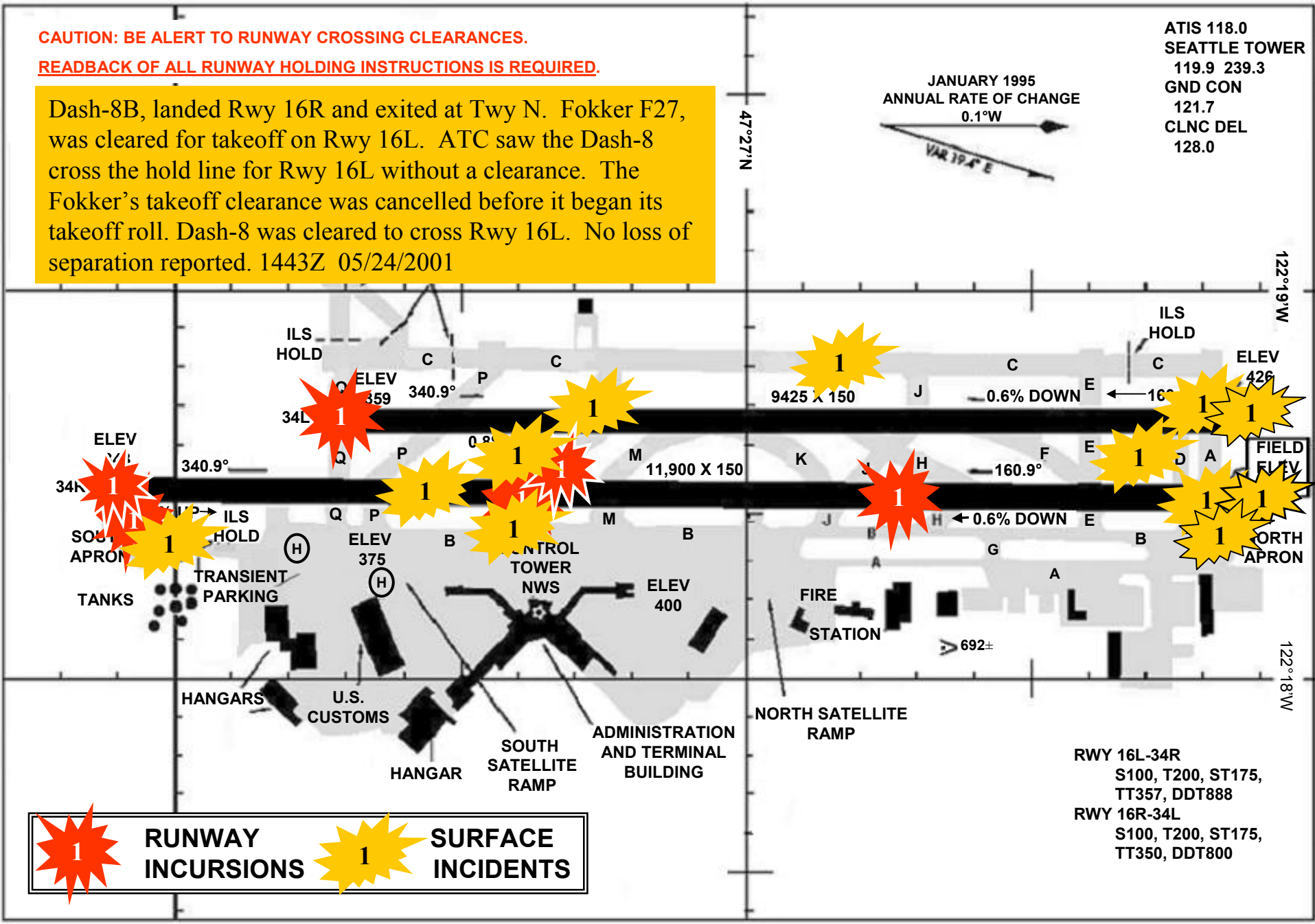

CAUTION: BE ALERT TO RUNWAY CROSSING CLEARANCES.
READBACK OF ALL RUNWAY HOLDING INSTRUCTIONS IS REQUIRED.
A pickup and a frontloader crossed Taxiways A and D en route to the Runway 16L glideslope building, No conflicts reported. 03/20/2001
ATIS 118.0
SEATTLE TOWER
119.9 239.3
GND CON
121.7
CLNC DEL
128.0
JANUARY 1995
ANNUAL RATE OF CHANGE
0.1°W
VAR 19.4° E
47°27'N
122°19'W
122°18'W
WEST RAMP
ILS HOLD
ILS HOLD
ILS HOLD
ILS HOLD
ELEV 426
ELEV 375
340.9°
340.9°
34L
0.8% UP
9425 X 150
0.6% DOWN
11,900 X 150
160.9°
0.6% DOWN
FIELD ELEV
SOUTH APRON
NORTH APRON
TRANSIENT PARKING
TANKS
CONTROL TOWER
NWS
ELEV 400
FIRE STATION
692±
HANGARS
U.S. CUSTOMS
HANGAR
SOUTH SATELLITE RAMP
ADMINISTRATION AND TERMINAL BUILDING
NORTH SATELLITE RAMP
RWY 16L-34R
S100, T200, ST175,
TT357, DDT888
RWY 16R-34L
S100, T200, ST175,
TT350, DDT800
RUNWAY INCURSIONS
SURFACE INCIDENTS


CAUTION: BE ALERT TO RUNWAY CROSSING CLEARANCES.
READBACK OF ALL RUNWAY HOLDING INSTRUCTIONS IS REQUIRED.
Piper PA32, cleared to land Runway 34L instead landed Runway 34R, no conflicts reported. 03/21/2001
ATIS 118.0
SEATTLE TOWER
119.9 239.3
GND CON
121.7
CLNC DEL
128.0
JANUARY 1995
ANNUAL RATE OF CHANGE
0.1°W
VAR 19.4° E
47°27'N
122°19'W
122°18'W
WEST RAMP
ILS HOLD
ELEV 426
9425 X 150
0.6% DOWN
340.9°
11,900 X 150
160.9°
0.8% UP
ELEV 375
TRANSIENT PARKING
TANKS
TOWER
NWS
ELEV 400
FIRE STATION
692±
HANGARS
U.S. CUSTOMS
HANGAR
SOUTH SATELLITE RAMP
ADMINISTRATION AND TERMINAL BUILDING
NORTH SATELLITE RAMP
RWY 16L-34R
S100, T200, ST175,
TT357, DDT888
RWY 16R-34L
S100, T200, ST175,
TT350, DDT800
RUNWAY INCURSIONS
SURFACE INCIDENTS

CAUTION: BE ALERT TO RUNWAY CROSSING CLEARANCES.

READBACK OF ALL RUNWAY HOLDING INSTRUCTIONS IS REQUIRED.

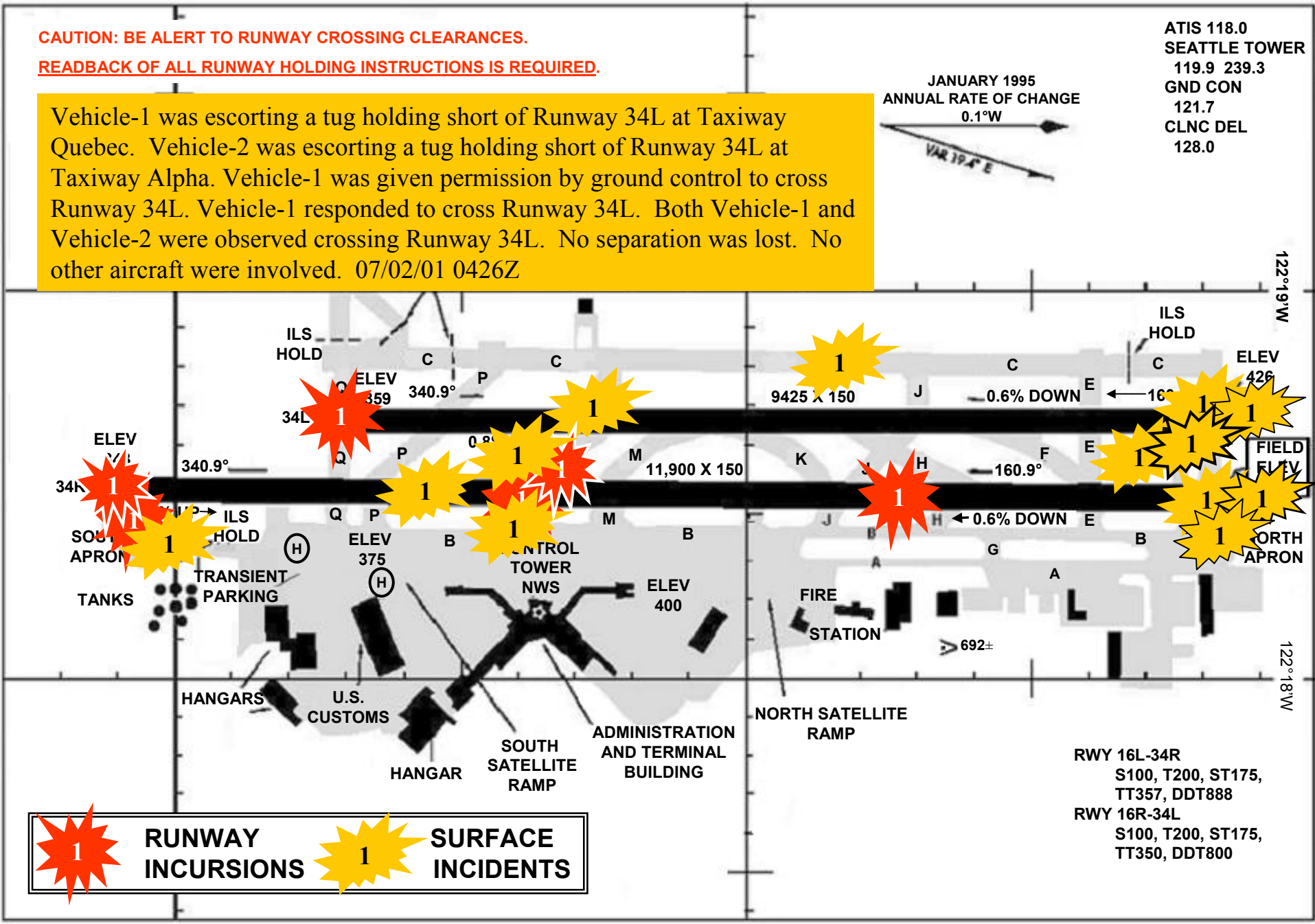
Dash-8B, landed Rwy 16R and exited at Twy N. Fokker F27, was cleared for takeoff on Rwy 16L. ATC saw the Dash-8 cross the hold line for Rwy 16L without a clearance. The Fokker's takeoff clearance was cancelled before it began its takeoff roll. Dash-8 was cleared to cross Rwy 16L. No loss of separation reported. 1443Z 05/24/2001

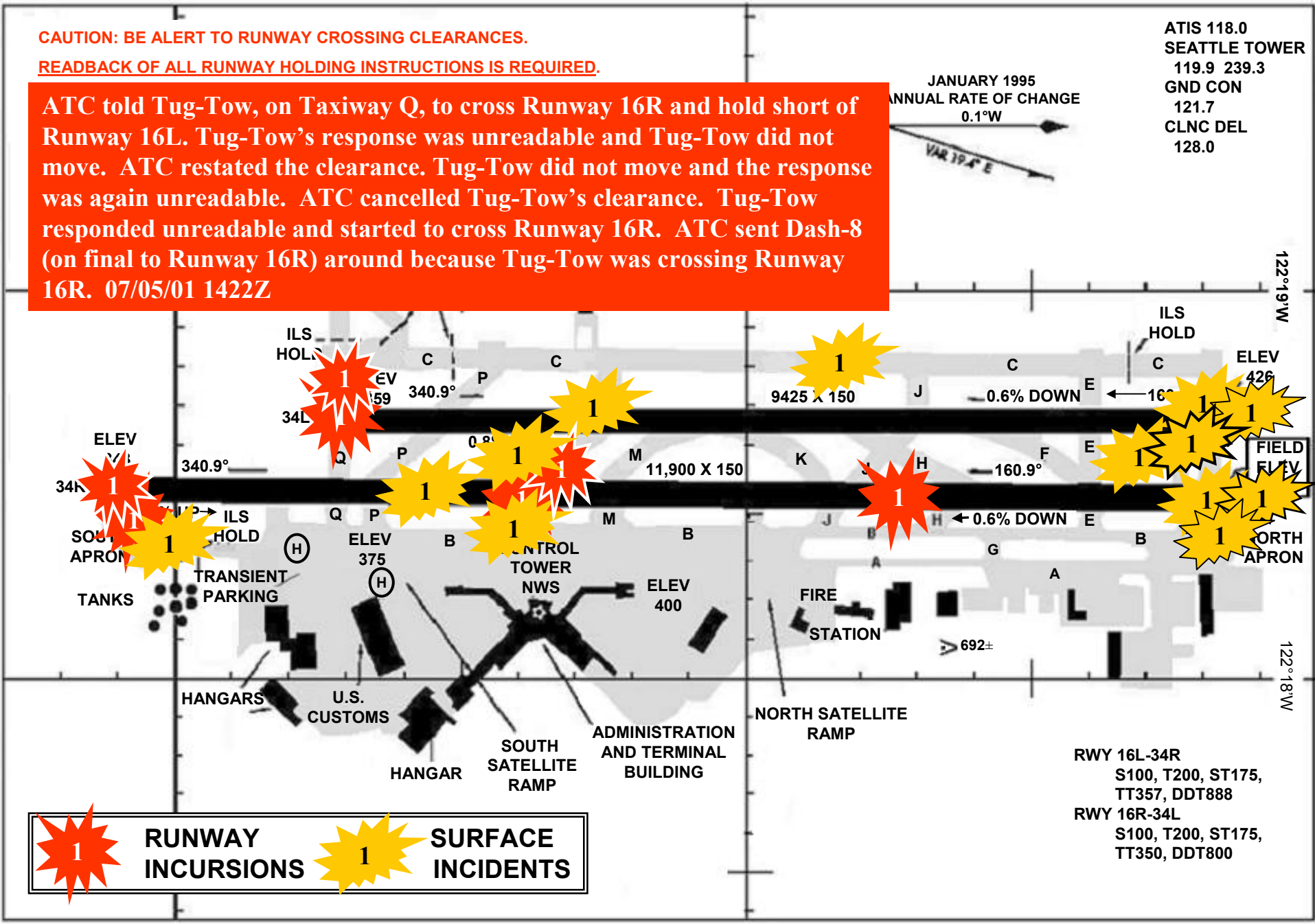


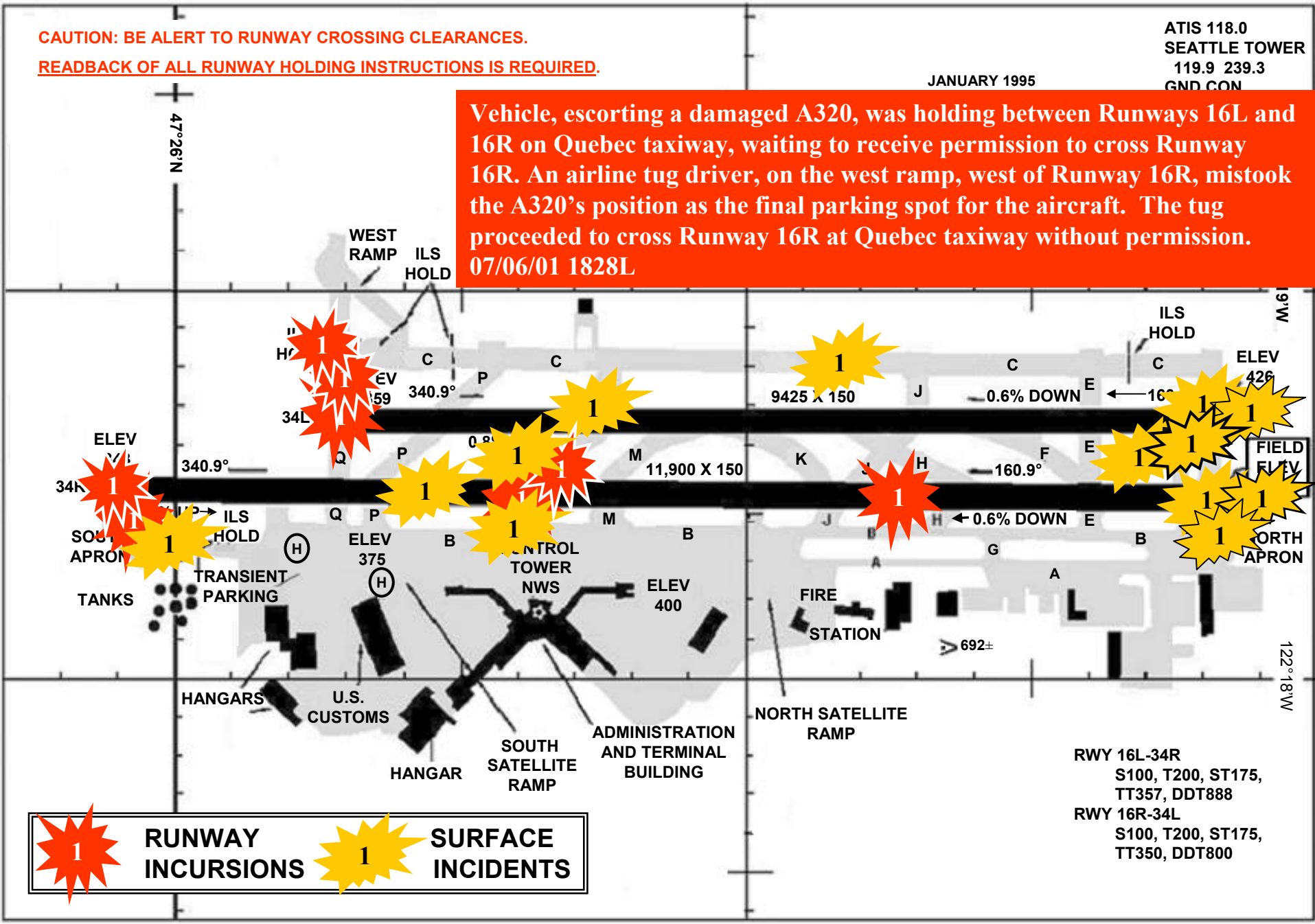
CAUTION: BE ALERT TO RUNWAY CROSSING CLEARANCES.

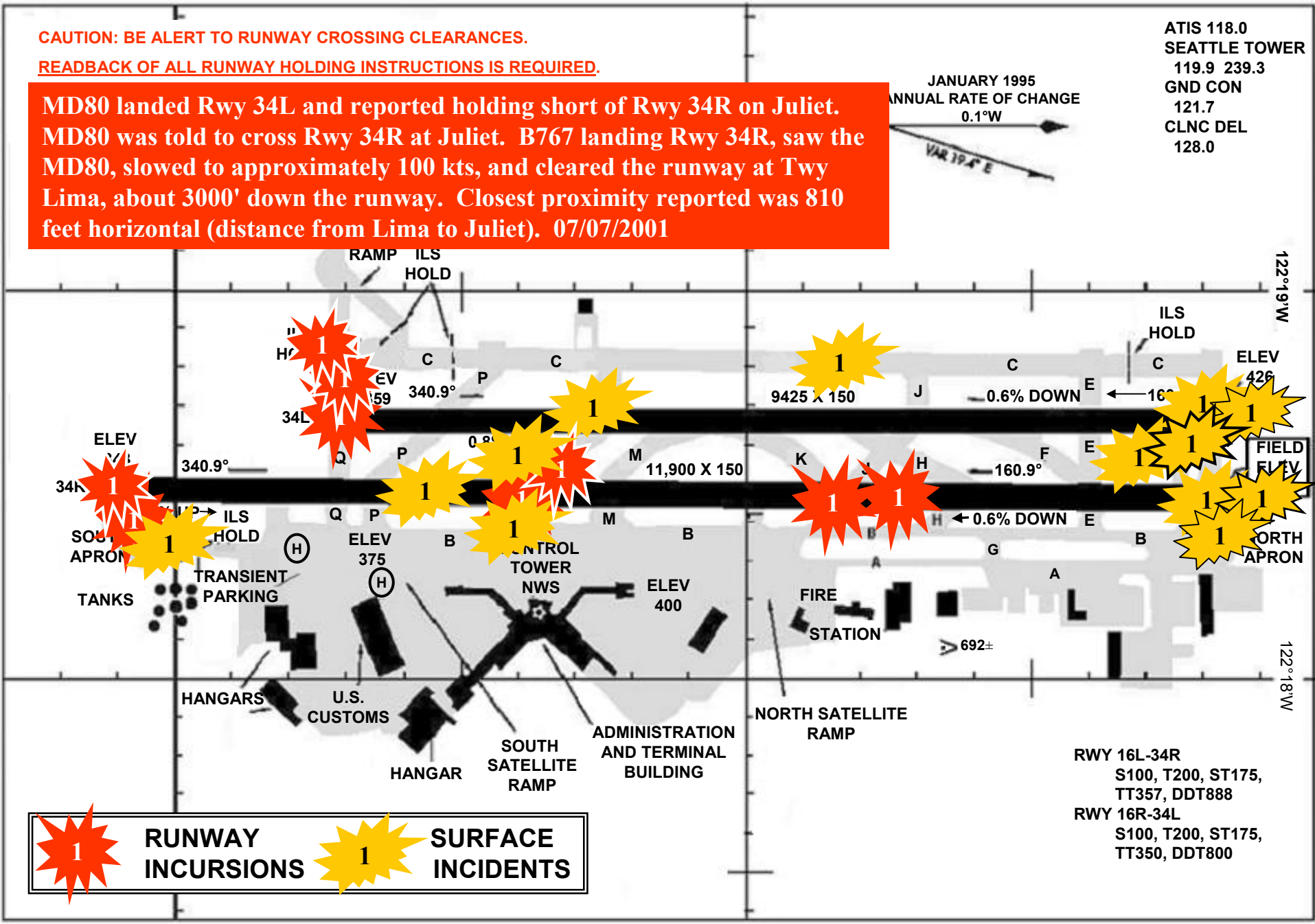
READBACK OF ALL RUNWAY HOLDING INSTRUCTIONS IS REQUIRED.

Vehicle-1 was escorting a tug holding short of Runway 34L at Taxiway Quebec. Vehicle-2 was escorting a tug holding short of Runway 34L at Taxiway Alpha. Vehicle-1 was given permission by ground control to cross Runway 34L. Vehicle-1 responded to cross Runway 34L. Both Vehicle-1 and Vehicle-2 were observed crossing Runway 34L. No separation was lost. No other aircraft were involved. 07/02/01 0426Z




CAUTION: BE ALERT TO RUNWAY CROSSING CLEARANCES.
READBACK OF ALL RUNWAY HOLDING INSTRUCTIONS IS REQUIRED.
ATC told Tug-Tow, on Taxiway Q, to cross Runway 16R and hold short of Runway 16L. Tug-Tow's response was unreadable and Tug-Tow did not move. ATC restated the clearance. Tug-Tow did not move and the response was again unreadable. ATC cancelled Tug-Tow's clearance. Tug-Tow responded unreadable and started to cross Runway 16R. ATC sent Dash-8 (on final to Runway 16R) around because Tug-Tow was crossing Runway 16R. 07/05/01 1422Z
ATIS 118.0
SEATTLE TOWER
119.9 239.3
GND CON
121.7
CLNC DEL
128.0
JANUARY 1995
ANNUAL RATE OF CHANGE
0.1°W
VAR 19.4° E
122°19'W
122°18'W
ILS HOLD
ELEV 426
9425 X 150
0.6% DOWN
340.9°
11,900 X 150
160.9°
0.6% DOWN
FIELD ELEV
ELEV 375
ELEV 400
TRANSIENT PARKING
TANKS
FIRE STATION
692±
HANGARS
U.S. CUSTOMS
HANGAR
SOUTH SATELLITE RAMP
ADMINISTRATION AND TERMINAL BUILDING
NORTH SATELLITE RAMP
RUNWAY INCURSIONS
SURFACE INCIDENTS
RWY 16L-34R
S100, T200, ST175, TT357, DDT888
RWY 16R-34L
S100, T200, ST175, TT350, DDT800

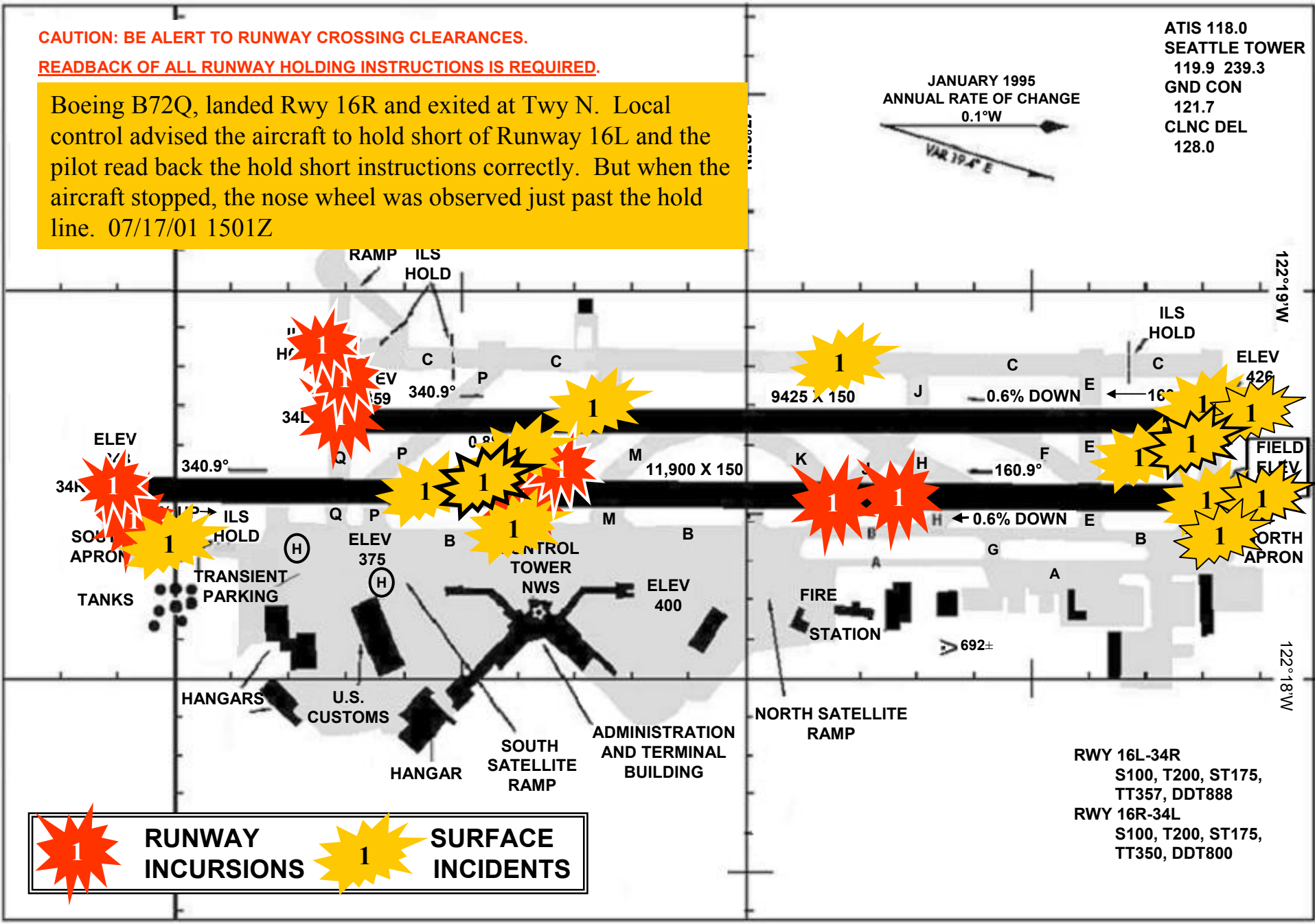

CAUTION: BE ALERT TO RUNWAY CROSSING CLEARANCES.
READBACK OF ALL RUNWAY HOLDING INSTRUCTIONS IS REQUIRED.
JANUARY 1995
ATIS 118.0
SEATTLE TOWER
119.9 239.3
GND CON
Vehicle, escorting a damaged A320, was holding between Runways 16L and 16R on Quebec taxiway, waiting to receive permission to cross Runway 16R. An airline tug driver, on the west ramp, west of Runway 16R, mistook the A320's position as the final parking spot for the aircraft. The tug proceeded to cross Runway 16R at Quebec taxiway without permission. 07/06/01 1828L
47°26'N
122°18'W
WEST RAMP
ILS HOLD
ELEV 426
340.9°
160.9°
11,900 X 150
9425 X 150
0.6% DOWN
FIELD ELEV
ELEV 375
ELEV 400
TRANSIENT PARKING
TANKS
FIRE STATION
692±
HANGARS
U.S. CUSTOMS
HANGAR
SOUTH SATELLITE RAMP
ADMINISTRATION AND TERMINAL BUILDING
NORTH SATELLITE RAMP
RUNWAY INCURSIONS
SURFACE INCIDENTS
RWY 16L-34R
S100, T200, ST175,
TT357, DDT888
RWY 16R-34L
S100, T200, ST175,
TT350, DDT800


CAUTION: BE ALERT TO RUNWAY CROSSING CLEARANCES.
READBACK OF ALL RUNWAY HOLDING INSTRUCTIONS IS REQUIRED.
MD80 landed Rwy 34L and reported holding short of Rwy 34R on Juliet. MD80 was told to cross Rwy 34R at Juliet. B767 landing Rwy 34R, saw the MD80, slowed to approximately 100 kts, and cleared the runway at Twy Lima, about 3000' down the runway. Closest proximity reported was 810 feet horizontal (distance from Lima to Juliet). 07/07/2001
ATIS 118.0
SEATTLE TOWER
119.9 239.3
GND CON
121.7
CLNC DEL
128.0
JANUARY 1995
ANNUAL RATE OF CHANGE
0.1°W
VAR 19.4° E
122°19'W
122°18'W
RAMP
ILS
HOLD
ELEV
426
340.9°
9425 X 150
0.6% DOWN
160.9°
11,900 X 150
FIELD
ELEV
ILS
HOLD
TRANSIENT
PARKING
TANKS
ELEV
375
TOWER
NWS
ELEV
400
FIRE
STATION
692±
HANGARS
U.S.
CUSTOMS
HANGAR
SOUTH
SATELLITE
RAMP
ADMINISTRATION
AND TERMINAL
BUILDING
NORTH SATELLITE
RAMP
RWY 16L-34R
S100, T200, ST175,
TT357, DDT888
RWY 16R-34L
S100, T200, ST175,
TT350, DDT800
RUNWAY
INCURSIONS
SURFACE
INCIDENTS

CAUTION: BE ALERT TO RUNWAY CROSSING CLEARANCES.

READBACK OF ALL RUNWAY HOLDING INSTRUCTIONS IS REQUIRED.

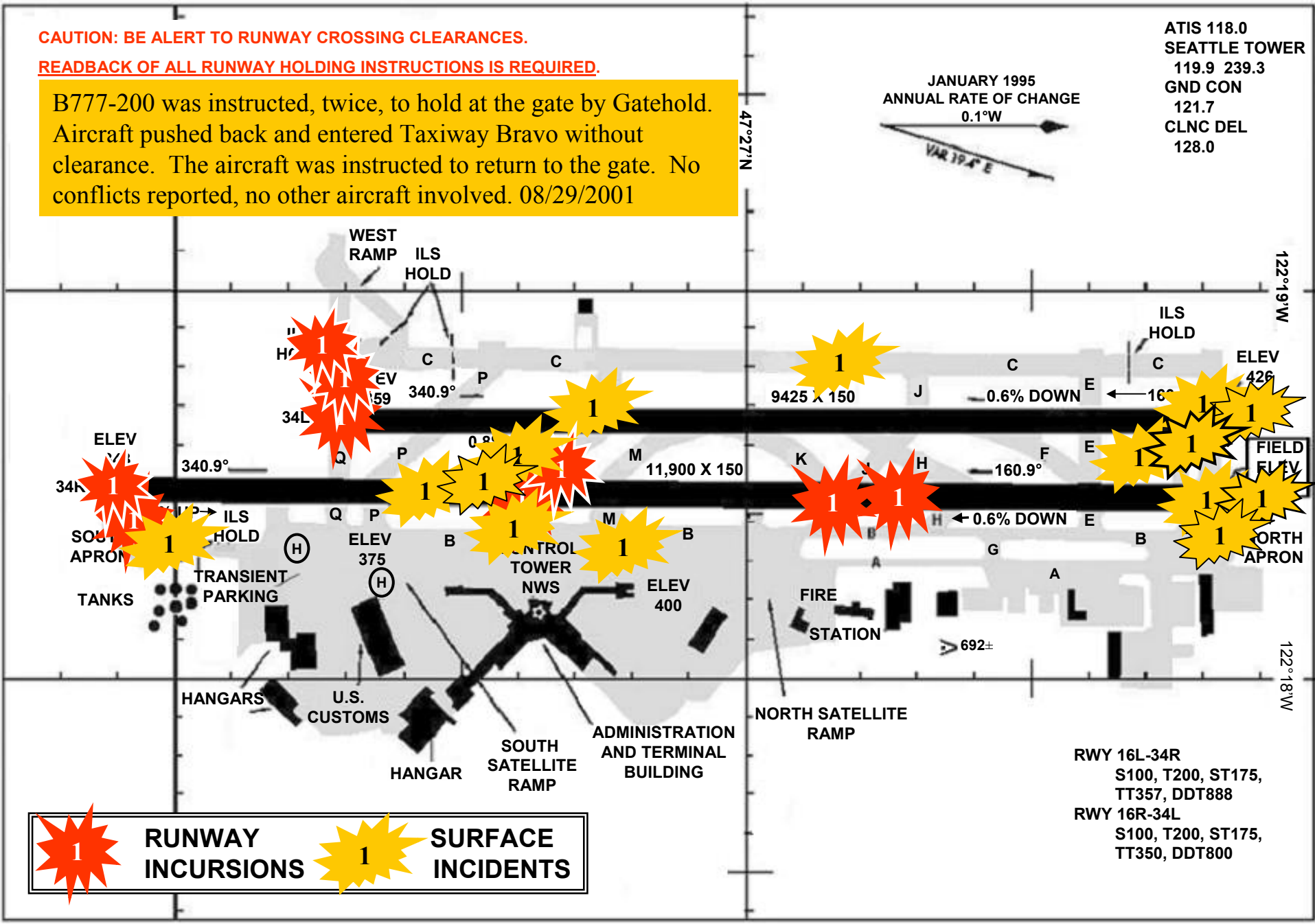
Boeing B72Q, landed Rwy 16R and exited at Twy N. Local control advised the aircraft to hold short of Runway 16L and the pilot read back the hold short instructions correctly. But when the aircraft stopped, the nose wheel was observed just past the hold line. 07/17/01 1501Z



CAUTION: BE ALERT TO RUNWAY CROSSING CLEARANCES.

READBACK OF ALL RUNWAY HOLDING INSTRUCTIONS IS REQUIRED.

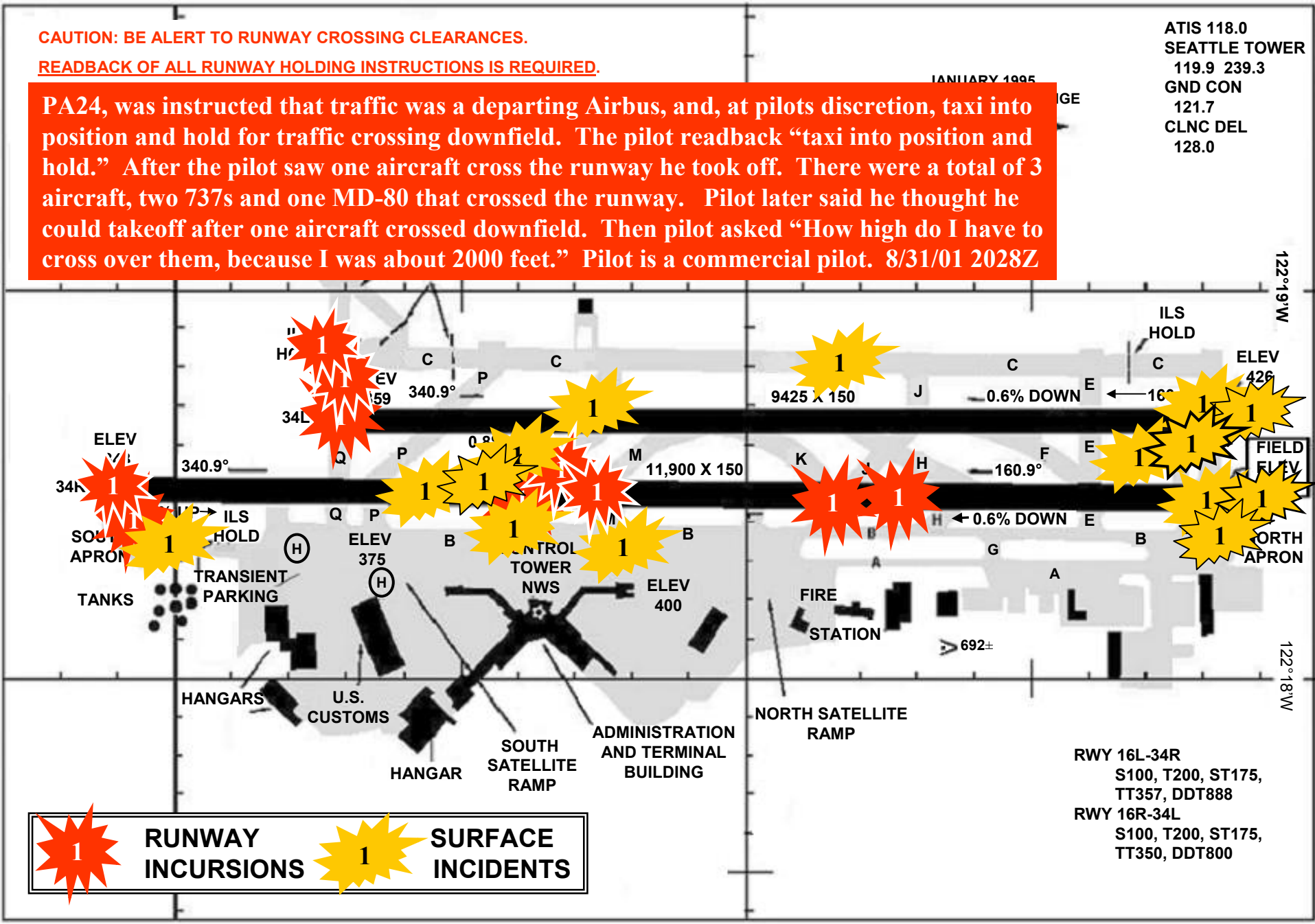
B777-200 was instructed, twice, to hold at the gate by Gatehold. Aircraft pushed back and entered Taxiway Bravo without clearance. The aircraft was instructed to return to the gate. No conflicts reported, no other aircraft involved. 08/29/2001



CAUTION: BE ALERT TO RUNWAY CROSSING CLEARANCES.

READBACK OF ALL RUNWAY HOLDING INSTRUCTIONS IS REQUIRED.

PA24, was instructed that traffic was a departing Airbus, and, at pilots discretion, taxi into position and hold for traffic crossing downfield. The pilot readback "taxi into position and hold." After the pilot saw one aircraft cross the runway he took off. There were a total of 3 aircraft, two 737s and one MD-80 that crossed the runway. Pilot later said he thought he could takeoff after one aircraft crossed downfield. Then pilot asked "How high do I have to cross over them, because I was about 2000 feet." Pilot is a commercial pilot. 8/31/01 2028Z



Local Problems require local Solutions

- Airport Traffic Control Tower
- Seattle-Tacoma International Airport