2007 Western States Fire Mission

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NASA Dryden Flight Research Center
The NASA Dryden Flight Research Center
Ikhana Project Team and
Ikhana
IKHANA UAS / Ground Control Station (GCS)

The Ikhana “Cockpit”
IKHANA

Pilot Displays for Situational Awareness

Falcon View Route

45 Degree Camera

Tracker Display

IR Camera

Color Camera

Electronic Flight Bag Xm Wx
Mission Control and Research Workstations
**Communications with Ikhana and ATC**

- **LOS - C-band Command/Control (simplified)**
- **OTH - Ku band Command/Control (simplified)**

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**ATC**

**Phone**
Western States Fire Mission 2007 Partners

IKHANA

Science Partners

Operational Partners
IKHANA

Ikhana with the Fire Sensor Pod

NASA Ames Fire Sensor
FAA Certificate of Authorization (COA)

IKHANA

COA Application Boundary

ZONE A

ZONE B

ZONE C

ZONE A, B, C
“Backbone” Routes

Zone A
Route A

Zone B
Route B

Zone C
Route C
IKHANA

Contingency Planning – Primary ELSs
Contingency Planning – Secondary ELSs

Route Specific ELS Subset
Pilot ELS Information

**038 Coyote Flats - USFS strip**
Inyo County, CA
- 37° 12' 12.97" N
- 118° 28' 34.15" W
- FRD: BIH193012
- Zones: A, B
- Length: 3000 ft.
- Type: Dirt
- Elev: 10000 ft.
- Sheriff Info:
  - Inyo County Sheriff, Bishop
  - Phone 760-873-7887
- WX:
  - BIH ASOS 125.25 13mi NE

Pilot Ranking: 3
Locked OK.
Mission Information

Flight Planning

FAA Certificate of Authorization (COA)

IKHANA

Restricted airspace

RVSM

FL410

FL290

FL230

FL430

Mission phase

Class A

18,000

Chase Aircraft required

Restricted airspace

6/3/2008
Western States Fire Missions 2007

IKHANA

WSFM 1  Aug. 16
4 Fires, 1400 nm, 9.5 hrs

WSFM 2  Aug. 29 – 30
7 Fires, 2500 nm, 16.1 hrs

WSFM 3  Sept. 7 – 8
12 Fires, 3200 nm, 20.0 hrs

WSFM 4  Sept. 27
BAER, 3 Fires, 1800 nm, 9.9 hrs
WSFM #1 2007

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Zaca Fire Images

Active Fire

Coby Fire

Yosemite

Tar Fire

Unknown Fire

Changing Fire Perimeter

Zaca Fire

Los Angeles

NASA
WSFM #2 2007

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New Detects from Overhead

3-D View

Castle Rock Fire Imagery

6/3/2008

EAA AirVenture 2008
IKHANA

Burn Area Emergency Rehabilitation and Stabilization (BAER) Assessment Imagery
WSFM 2007 Objectives Accomplished

New Research Configuration

Flexible Rubber Tape
WSFM 5  
Oct. 24, 11 Fires,  
~1350 nm, 9.0 hrs  

WSFM 6  
Oct. 25, 8 Fires,  
~1350 nm, 7.8 hrs  

WSFM 7  
Oct. 26, 8 Fires,  
~1350 nm, 7.8 hrs  

WSFM 8  
Oct. 28, 8 Fires,  
~1350 nm, 7.1 hrs
WSFM #5 Emergency Response 2007

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Harris Fire
Hot Detects

Ammo Fire
Hot Detects
WSFM #6 Emergency Response 2007

IKHANA

Poomacha / Rice Fires – 3D with Hot Detects

Grass Valley / Slide Fires – 3D with Hot Detects
WSFM #7 Emergency Response 2007

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Santiago Fire – 3D with Hot Detects

Ranch Fire – 3D
WSFM #8 Emergency Response 2007

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Ranch, Ammo and Esperanza

BAER

Santiago Fire Detects Ranch, Ammo and Esperanza

BAER

Ranch, Buckweed

BAER

Grass Valley / Slide

Santiago

Esperanza ‘06

BAER

Poomacha

Rice

Witch

Housing

Ranch, Buckweed

BAER

San Diego

Esperanza ‘06

BAER

Poomacha

Rice

Witch

Housing
### WSFM Achievements

#### IKHANA

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<td>9.5 hrs</td>
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<td>29 Aug</td>
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<td>5</td>
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WSFM Challenges

IKHANA

Operational

Planning