



1
00:00:01,280 --> 00:00:03,200



2
00:00:03,200 --> 00:00:04,840
>>Get to work at five o'clock...

3
00:00:05,600 --> 00:00:07,720
Morning briefing
at six thirty...

4
00:00:08,200 --> 00:00:10,280
It's just another
day at the office...

5
00:00:10,600 --> 00:00:12,200
Or... is it really?

6
00:00:14,160 --> 00:00:15,880
>>There's a lot to
juggle in the field.

7
00:00:15,880 --> 00:00:17,720
So life in the field
can be quite hectic.

8
00:00:17,920 --> 00:00:19,960
It takes 3 hours to do
a full warm up

9
00:00:19,960 --> 00:00:21,560
of all the instruments
on this aircraft.

10
00:00:21,560 --> 00:00:23,520
That means to start at
5:00 AM in the morning

11
00:00:23,680 --> 00:00:25,560
and to take off

at about 8:00 AM.

12

00:00:27,200 --> 00:00:28,960

The forecasters will look
at the conditions,

13

00:00:28,960 --> 00:00:31,160

to verify that the
flight is ready to go

14

00:00:31,160 --> 00:00:33,760

and the plane will take off
for an 8 hour flight.

15

00:00:35,160 --> 00:00:37,880

>>So, if you are a scientist
studying air pollution,

16

00:00:38,240 --> 00:00:40,520

where should you be
doing your research...?

17

00:00:41,000 --> 00:00:42,360

Yup! That's right...

18

00:00:42,560 --> 00:00:44,040

In the air!

19

00:01:13,600 --> 00:01:17,120

■

20

00:01:17,120 --> 00:01:19,520

>>And once the plane takes off...
the fun begins!

21

00:01:21,160 --> 00:01:22,760

There's a lot of talk
on the headsets

22

00:01:22,760 --> 00:01:26,160
about what we're seeing
and whether it makes sense

23

00:01:26,160 --> 00:01:27,960
in terms of what the
models had predicted.

24

00:01:27,960 --> 00:01:29,760
Don't forget that this aircraft

25

00:01:29,760 --> 00:01:31,000
is flying in the atmosphere

26

00:01:31,000 --> 00:01:32,520
to verify whether the models

27

00:01:32,520 --> 00:01:34,520
can do a good job of
predicting air quality.

28

00:01:38,240 --> 00:01:42,120
Each flight begins with a pass
through the city of Seoul,

29

00:01:42,360 --> 00:01:44,320
for a chance to see
what that looks like,

30

00:01:44,640 --> 00:01:46,240
and then we go to high altitude

31

00:01:46,240 --> 00:01:50,160
to fly along the peninsula along
a route that we've chosen

32

00:01:50,160 --> 00:01:52,400
and looking down, with
what we call the "LIDAR".

33

00:01:52,680 --> 00:01:54,880

The lasers that point
underneath the aircraft,

34

00:01:54,880 --> 00:01:57,040

provide information on
the pollution levels

35

00:01:57,040 --> 00:01:59,160

at different altitudes
down toward the ground.

36

00:01:59,320 --> 00:02:01,520

And we have to use that
information to decide

37

00:02:01,520 --> 00:02:04,160

where we will want
to sample in altitude

38

00:02:04,160 --> 00:02:07,560

along that same path
following the LIDAR pass.

39

00:02:11,880 --> 00:02:14,400

That 8 hour flight
does not stop us

40

00:02:14,400 --> 00:02:16,600

from continuing
forecasting on the ground

41

00:02:16,600 --> 00:02:20,040

and trying to give information
to the flight as it happens

42

00:02:20,040 --> 00:02:22,120

in case conditions change.

43

00:02:25,640 --> 00:02:27,560

And so those days
can be very busy

44

00:02:27,560 --> 00:02:29,400

between planning
tomorrow's flight

45

00:02:29,400 --> 00:02:31,920

But making sure that
today's flight happens well.

46

00:02:34,680 --> 00:02:36,480

>>There's a lot to do
on the flight days

47

00:02:36,480 --> 00:02:38,400

for the scientists
onboard the aircraft.

48

00:02:38,560 --> 00:02:40,280

However, there are other teams

49

00:02:40,280 --> 00:02:42,480

that also have to be working
around the clock

50

00:02:42,480 --> 00:02:45,080

in order to have these
airborne laboratories ready

51

00:02:45,080 --> 00:02:47,320

for investigating
the atmosphere.

52

00:02:50,040 --> 00:02:52,400

>>On this mission, the
maintenance crew is pretty busy.

53

00:02:52,400 --> 00:02:54,400

We've got so many
scientists on board...

54

00:02:54,400 --> 00:02:55,400

All the scientists have

55

00:02:55,400 --> 00:02:56,920

different needs and requirements

56

00:02:56,920 --> 00:02:58,360

such as changing out some of

57

00:02:58,360 --> 00:03:00,400

the gasses they

have on the airplane.

58

00:03:00,640 --> 00:03:04,480

They also make sure that the

airplane is pre-flight right

59

00:03:04,480 --> 00:03:06,200

so we're good to go.

60

00:03:06,200 --> 00:03:09,200

Check a lot of the systems...

refueling the airplane...

61

00:03:09,800 --> 00:03:13,480

Before the flight, they take off

those covers off all the probes

62

00:03:13,480 --> 00:03:15,800

which actually takes

quite a while.

63

00:03:15,800 --> 00:03:17,160

And then, after the flight,

64

00:03:17,160 --> 00:03:18,800

they need to put
those back in place.

65

00:03:19,000 --> 00:03:20,040
So, the maintenance crew...

66

00:03:20,040 --> 00:03:21,800
They are the first guys
to show up in the morning

67

00:03:21,800 --> 00:03:23,920
and the last guys to leave
at the end of the day.

68

00:03:24,400 --> 00:03:27,280
They make sure we have a good
jet for that day's mission

69

00:03:27,960 --> 00:03:30,160
and, if we break the jet
on that mission,

70

00:03:30,160 --> 00:03:32,000
they're the ones
who got to fix it

71

00:03:32,000 --> 00:03:33,920
and get it ready
for the next one.

72

00:03:37,880 --> 00:03:41,280
>>Teamwork is the key to
a successful campaign.

73

00:03:44,360 --> 00:03:46,480
The KORUS-AQ mission involves

74

00:03:46,480 --> 00:03:49,480
the coordinated effort
of over 500 people!

75

00:03:51,560 --> 00:03:54,480

>>We have 505 people registered
on the mission website

76

00:03:54,480 --> 00:03:56,400

and, of those, about 300

77

00:03:56,400 --> 00:03:58,120

have been active participants

78

00:03:58,120 --> 00:03:59,920

at some point
during the deployment.

79

00:03:59,920 --> 00:04:00,920

And we have to ensure that

80

00:04:00,920 --> 00:04:02,240

everybody had access

81

00:04:02,240 --> 00:04:03,560

when they needed it.

82

00:04:04,480 --> 00:04:07,440

>>Scientists, crew, technicians...

83

00:04:07,720 --> 00:04:11,520

but also equipment,
supplies, logistics...

84

00:04:12,560 --> 00:04:14,920

A massive scientific
research mission

85

00:04:14,920 --> 00:04:19,040

requires planning ahead
and effective management.

86

00:04:21,060 --> 00:04:22,860

>>Preparations for
something of this size

87

00:04:22,880 --> 00:04:24,400

begin years in advance.

88

00:04:24,560 --> 00:04:26,160

So having already visited here

89

00:04:26,160 --> 00:04:28,440

with the Earth Science Project
Office several times

90

00:04:28,440 --> 00:04:30,120

we were able to put together

91

00:04:30,120 --> 00:04:32,280

a situation that would enable

92

00:04:32,280 --> 00:04:33,480

this many scientists

93

00:04:33,480 --> 00:04:35,920

and these many resources
to be put into play.

94

00:04:38,800 --> 00:04:41,040

>>ESPO is involved in all
phases of the mission,

95

00:04:41,040 --> 00:04:42,640

from its conception,

96

00:04:42,640 --> 00:04:44,960

to its planning and
the implementation.

97

00:04:45,400 --> 00:04:48,120

We need to understand
what the researchers want,

98

00:04:48,120 --> 00:04:49,680

which become our requirements,

99

00:04:49,680 --> 00:04:51,240

and then we come here

100

00:04:51,240 --> 00:04:53,960

and see how we can best
meet those requirements,

101

00:04:53,960 --> 00:04:56,720

whether they are logistical
or operational.

102

00:04:57,440 --> 00:04:59,360

>>The Earth Science Project Office

103

00:04:59,360 --> 00:05:01,280

is in charge of
managing the mission.

104

00:05:01,640 --> 00:05:03,640

Anything you need to
accomplish your objectives

105

00:05:03,640 --> 00:05:04,640

during the mission...

106

00:05:04,880 --> 00:05:06,600

They are the people to go to!

107

00:05:07,800 --> 00:05:09,560

>>Entering a foreign country
is very difficult

108

00:05:09,560 --> 00:05:11,080
with all the things
that we bring...

109
00:05:11,280 --> 00:05:13,160
Operating in a foreign
country is difficult

110
00:05:13,160 --> 00:05:15,400
because their airspace
is very busy and maybe

111
00:05:15,400 --> 00:05:17,480
some of their procedures
are different than ours...

112
00:05:17,720 --> 00:05:19,840
and keeping the flow of people

113
00:05:20,080 --> 00:05:23,480
and information
and equipment smooth

114
00:05:24,200 --> 00:05:26,080
and, in a way that
does not interrupt

115
00:05:26,080 --> 00:05:28,120
or distract us from the science,

116
00:05:28,120 --> 00:05:29,360
is a great talent

117
00:05:29,360 --> 00:05:32,880
and we appreciate the Earth
Science Project Office support.

118
00:05:34,120 --> 00:05:36,320
>>They are the ones making
sure scientists have

119

00:05:36,320 --> 00:05:39,320
everything they need
to keep working every day.

120

00:05:41,320 --> 00:05:43,080
So if you want
to do a good job...

121

00:05:43,320 --> 00:05:45,080
you have to go
to the right place

122

00:05:45,280 --> 00:05:46,960
and measure at the right time

123

00:05:47,160 --> 00:05:48,560
with the right people.

124

00:05:49,040 --> 00:05:51,440
And for these people,
the right place...

125

00:05:51,640 --> 00:05:53,200
is in the air!

126

00:05:58,080 --> 00:06:00,240
Although in the end, for them,

127

00:06:00,240 --> 00:06:03,080
maybe it wasn't just like
another day at the office!

128

00:06:04,960 --> 00:06:07,040
>>Yeah! It's a totally
different experience.

129

00:06:07,240 --> 00:06:08,760
>>The work we do here day to day

130

00:06:08,760 --> 00:06:10,480

is much different than
what we do in the lab.

131

00:06:10,480 --> 00:06:13,880

>>I've been waking up pretty
early, at about 4 am...

132

00:06:14,120 --> 00:06:16,360

and then we get out
here at about five

133

00:06:16,360 --> 00:06:18,320

to warm up our instrument
because the laser

134

00:06:18,320 --> 00:06:20,800

takes a while to warm up
to peak power.

135

00:06:20,800 --> 00:06:22,560

>>We'll be taking out
gas cylinders...

136

00:06:22,560 --> 00:06:24,040

and putting in new ones...

137

00:06:24,040 --> 00:06:27,120

>>After every flight we
switch out the air canisters

138

00:06:27,120 --> 00:06:28,440

for the next day's flight...

139

00:06:28,440 --> 00:06:31,200

>>Filling water or
calibrating the instruments...

140

00:06:31,200 --> 00:06:33,160
making sure they're
running correctly...

141
00:06:33,160 --> 00:06:34,160
>>And then we come back out

142
00:06:34,160 --> 00:06:35,800
and mess with the
laser a little more...

143
00:06:35,800 --> 00:06:39,760
>>So I've definitely developed
my muscle mass here!

144
00:06:40,640 --> 00:06:42,760
>>It's a lot of work...
but it's also a lot of fun!

145
00:06:42,760 --> 00:06:44,120
And definitely different