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AN OVERVIEW OF THE ACTIVITIES ON CLOUD SEEDING EXPERIMENT IN KOREA

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1. INTRODUCTION

In Korea, a cloud seeding experiment was conducted using a ground-based AgI generator and an aircraft dry ice dispenser in 1963 and 1964. That experiment was discontinued due to technical problems. In 1994 and 1995, a severe drought hit the Korean Peninsula. The Korea Meteorological Administration (KMA) decided to again start a cloud seeding project for precipitation enhancement. The Meteorological Research Institute (METRI) started experiments in April 1995, using a CN235M airplane of the Korea Air Forces to conduct airborne seeding operations.

2. RESEARCH AND EXPERIMENT ACTIVITIES

Researchers in METRI visited the USA and China to get technical information on cloud seeding techniques and devices. Based on information from these visits, a ground-based AgI generator was designed by METRI and five generators were manufactured. This generator is composed of a burner with a AgI solution tank, an LPG fuel tank, and a nitrogen gas tank. To date, five ground-based cloud seeding experiments with silver iodide have been performed (METRI, 1996). The main target area was the eastern mountainous area of Korea. The first experiment was only a test of the ground-based generators. It was successful except for an intermittent nozzle clogging problem. The second and third experiments for snowpack augmentation from orographic cumuliform clouds were conducted in December 1995 and January 1996, respectively. Typical cloud top temperature was about -5°C. AgI dispersion rates were 22 to 26 g/hr. Total seeding periods were about four to six hours. We confirmed that the seeding was effective because the average silver concentration (0.059 ppb) of snow samples in seeded areas was three times higher than those (0.016 ppb) in background areas. To do this, snow was sampled at ten stations for unseeded cases and at fifteen stations for seeded cases using five automatic precipitation samplers. These samples were analyzed using HR ICP/MS. For the fourth (Feb. 1996) and fifth (Mar. 1996) experiments, we couldn't detect the seeding effect; very little snowfall was experienced in trials four and five. The important result from these experiments was to find the effects of cloud seeding through the quantitative analysis of silver from snow samples.

Aircraft experiments using dry ice were performed three times, but it was impossible to confirm the seeding effect except by visual indications of enhanced ice near the top of clouds. In September 1996, another experiment, which used ejectable AgI flares designed by METRI for aircraft CN235M, was conducted to test the safety of the system in September 1996. As a result, this device was proven to be safe and suitable for airborne seeding.

3. FUTURE PLAN

Beginning in October 1996, aircraft experiments using AgI flares will be performed twice a month. The main target will be cumuliform clouds at temperatures below -5°C. The seeding will be conducted in and on the top of clouds. Also, dry ice will be used as seeding material depending on cloud condition.

Besides aircraft seeding, six ground-based generators will be installed at a mountain area in central Korea after their performance has been improved. Ground-based seeding experiments will also be conducted.

A small pilotless aircraft has been under consideration as a seeding tool to improve the seeding effect in a relatively small target area. Also, an ex-

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perimental attempt at cold fog dispersion will be made at Kimpo International Airport in the next winter season.

4. CONCLUDING REMARKS

Cloud seeding for precipitation enhancement was recently started in Korea. We plan to test various new seeding methods and materials. In addition, many Korean researchers will be trained abroad in the science and art of weather modification. We expect that experimental cloud seeding activities will increase in Korea.

5. REFERENCES

METRI, 1996: Mid-term Report on Temporary Results of Cloud Seeding Experiment in Korea (in Korean).