# Nebraska's '97 Ingestion Exercise: Communication Through 2 Phases of Response

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## INTRODUCTION

The ingestion pathway exercise was demonstrated at Fort Calhoun Nuclear Station following a standard plume phase exercise in June, 1997. Ft. Calhoun is located on the Missouri River. Participants included the State representatives of Iowa and Nebraska from both the emergency management and health departments, now Health and Human Services Regulation and Licensure, HHS R&L, in Nebraska. There were no Federal participants or power plant representatives. This was in contrast to the 1993 Federal Radiological Monitoring and Assessment Center, FRMAC, which was conducted in June of 1993 with full Federal participation.

HHS R&L provide technical advice and assistance to the Governor's Authorized Representative from the Nebraska Emergency Management Agency, NEMA. The challenge in an ingestion exercise is to communicate technical information concerning the first two phases of radiological emergency response. The phases are Early or Plume Phase and the Intermediate Phase which is when the source and releases are under control. There are two components to the Intermediate Phase regarding Protective Actions. One component restricts access to areas which have projected doses of 2 Rem or greater. The other component restricts ingestion of contaminated food and water. The protective actions may be developed simultaneously.

## DISCUSSION

The initial plume phase resulted in activity deposited to the northwest of the plant and located in Nebraska. Due to the fact that the wind shifted during the release, the area to the south and east of the plant out to 5 miles had also been evacuated as a precautionary measure. This area was not considered to have ground deposition. We did have the results of the Department of Energy, DOE, flyover, Figure 1, immediately following the plume phase.

The first lesson concerned the best use of the field teams. Even though this was simulated activity, we had to be very specific about where we wanted immediate information. We assumed that we had four field teams at our disposal. In addition to Ion Chambers for accurate dose readings, one field team was assumed to have the use of a portable multi-channel analyzer, MCA, which was borrowed from Iowa. The team with the MCA obtained field data from the area of ground deposition By the following morning, we had identified and measured concentrations of the major isotopes. This information confirmed that the isotopic mix was

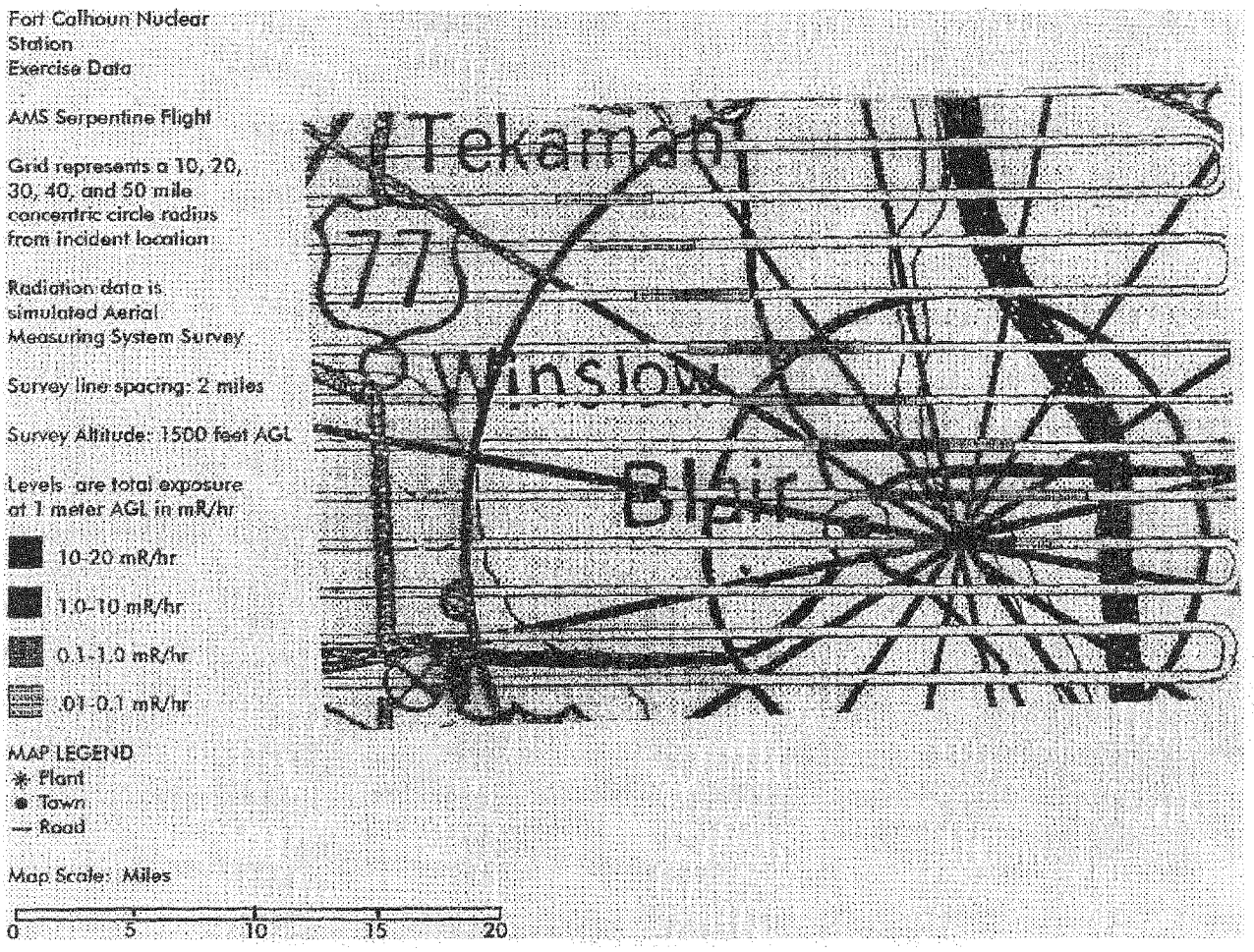


FIGURE 1 - DOE Flyover Showing Ground Deposition

uniform. We knew that the dose rate corresponding to 2 Rem/year for the restricted area was 3.7 mrem. Two other field teams conducted surveys along major roads and intersections to give us dose rates. These were used in conjunction with the gamma spectrometry information to identify the restricted zone. One field team was sent to confirm that there was no deposition in the clean area.

The next lesson learned involved our communication of the restricted area to the Emergency Management Agency. Figure 2 shows the restricted area based on the field team results. The restricted access area covered a sector and a half out to a distance of 5 miles. Our first communications obstacle arose when the restricted area map developed by HHS R&L staff indicated that the part of the town of Blair, (south of Highway 75), could be released, but the north area would subject its inhabitants to more than the recommended 2 Rem per year. Also, the Blair's water treatment system was located in the restricted area. The local authorities and

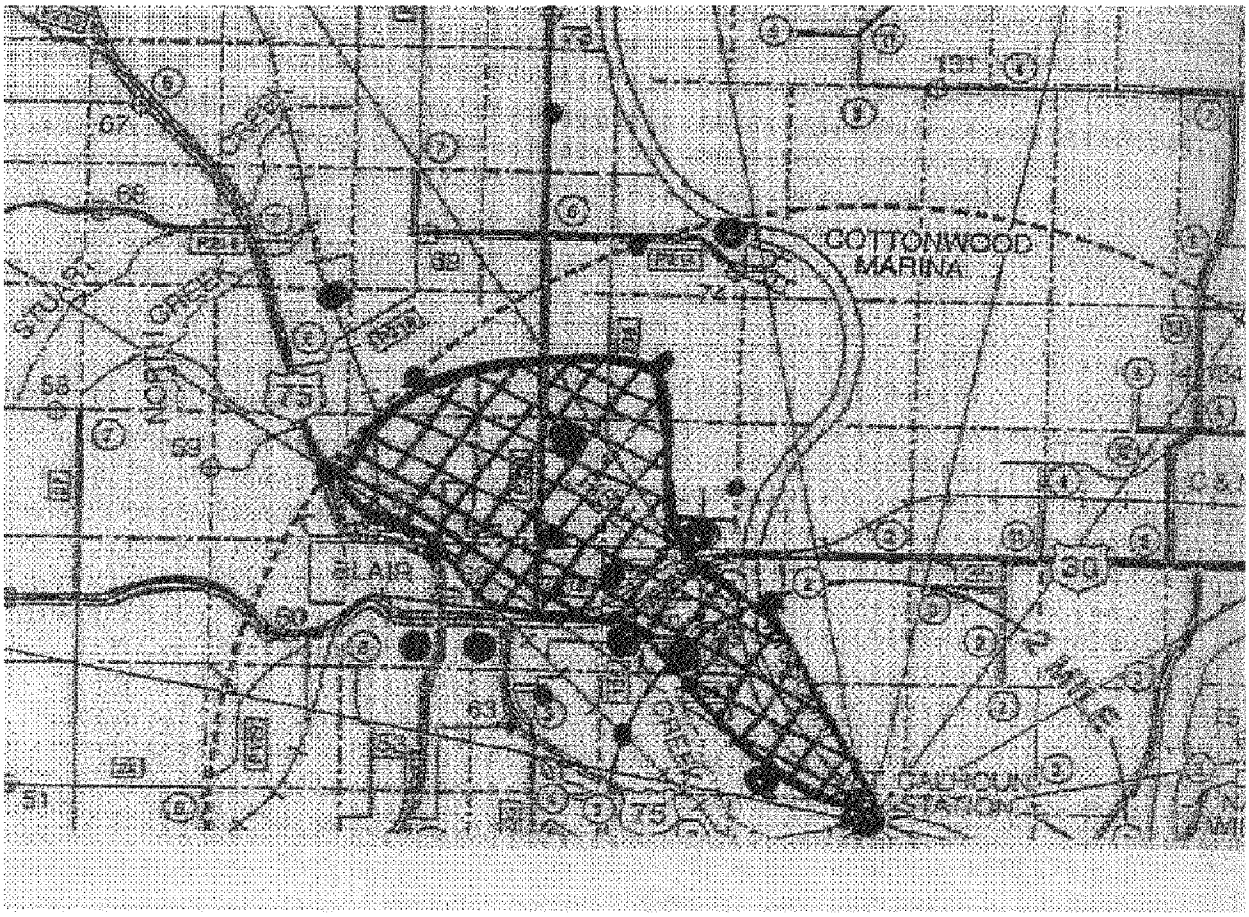


FIGURE 2 - Restricted Area Based on Field Team Results

NEMA had developed a standard policy of not splitting a town in half for evacuation. Therefore, initially at least, it did not make sense to them to split the town in half for purposes of restricting access. Their perspective, which carried over from the early phase, was that access to the entire town of Blair should be restricted.

There were health physics issues associated with the restricted zone. The "re-entry" check-point for those individuals with urgent business in the restricted zone required staffing in order to provide TLDs and survey meters. We were requested to determine probable dose rates, how to adequately monitor these individuals during their re-entry, and to provide training as individuals re-entering would now be classified as occupational workers. We were asked what would the dose limit be for these workers. The missing piece of information is how much time over the course of a year would an individual need to spend in the area. A recommendation would be to set some predetermined dose rates that would be acceptable. We utilized 2 Rem as our initial working limit, but our State Emergency Plan has since been updated to the 5 Rem which is recommended in EPA 400.