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# Hot Cell Facility Modifications at Sandia National Laboratories* to Support $^{99}$Mo Production

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## Introduction

In September, 1996, following the completion of an extensive Environmental Impact Statement (EIS), a record of decision (ROD) was issued by DOE selecting Sandia as the facility to take on the $^{99}$Mo production mission. $^{99}$Mo is the precursor to $^{99m}$Tc which is used in 36000 medical procedures per day in the US. To meet US $^{99}$Mo medical demands, 20 kCi of $^{99}$Mo must be delivered to the pharmaceutical companies each week. This could be accomplished by the processing of twenty-five targets (total fission product of 15 kCi/target) each week within the SNL Hot Cell Facility (HCF). To accomplish this new mission, significant modifications to the HCF will have to be undertaken. This paper presents a brief history of the HCF, and describes modifications necessary to achieve DOE directives.



## Description of Work

The original HCF (see Figure 1) consisted of hot cells shielded with concrete, glove boxes shielded with steel plate, unshielded glove boxes, and unshielded hoods. The facility was designed to protect both the workers and the environment through shielding and confinement barriers. The confinement barriers are supplemented by the use of pressure



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zones supplying a negative pressure gradient between the contaminated areas and the occupied areas of the facility. To maintain this pressure gradient, a set of ventilation fans and HEPA filters are used. The discharge of these fans is to a 100 foot tall exhaust stack located 60 feet north of the HCF. Prior to being discharged to this stack, the exhaust is monitored to determined actual environmental discharges.

FY98 HCF modifications support the waste handling requirement to and from HCF room 109. The process residue from the $^{99}$Mo targets must be housed for initial activity decay (the target activity drops from 15,000 Ci at time of processing to less than 100 curies at six months). At full production, waste inventory will be less than 1MCi, a factor of 100 less than was the gamma dose from past operation of the SER reactor. Although the facility storage room (room 109) is more than adequate for this short term storage, the facility will have to be modified (see Figure 2) to provide handling systems to and from this room. Other modifications will be undertaken to achieve significant personnel dose reductions through process flow improvements throughout the facility. Process flow improvements will include additional entrances and exits from the process area.

FY99 HCF modifications support the installation of additional processing stations. These process stations are required to extend our target processing capability from 2 to 6 targets per day.

## Conclusion

Based on the current planned FY98 and FY99 funding profiles, with these modifications, the HCF will be capable of meeting 30% of the US demand for $^{99}$Mo at the end of FY98 and 100% of the US demand for $^{99}$Mo at the end of FY99.

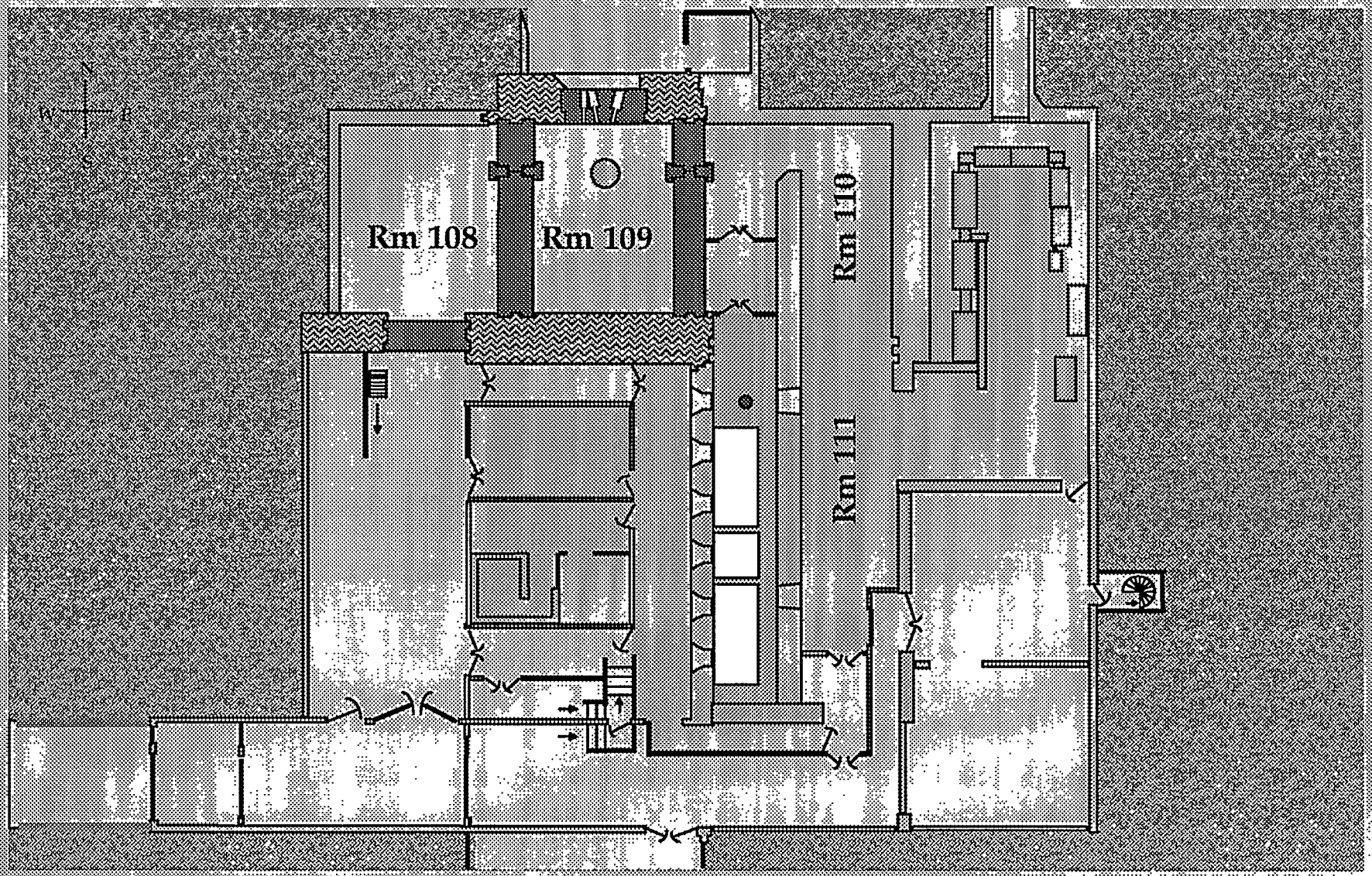


**Figure 1: Original Hot Cell configuration**

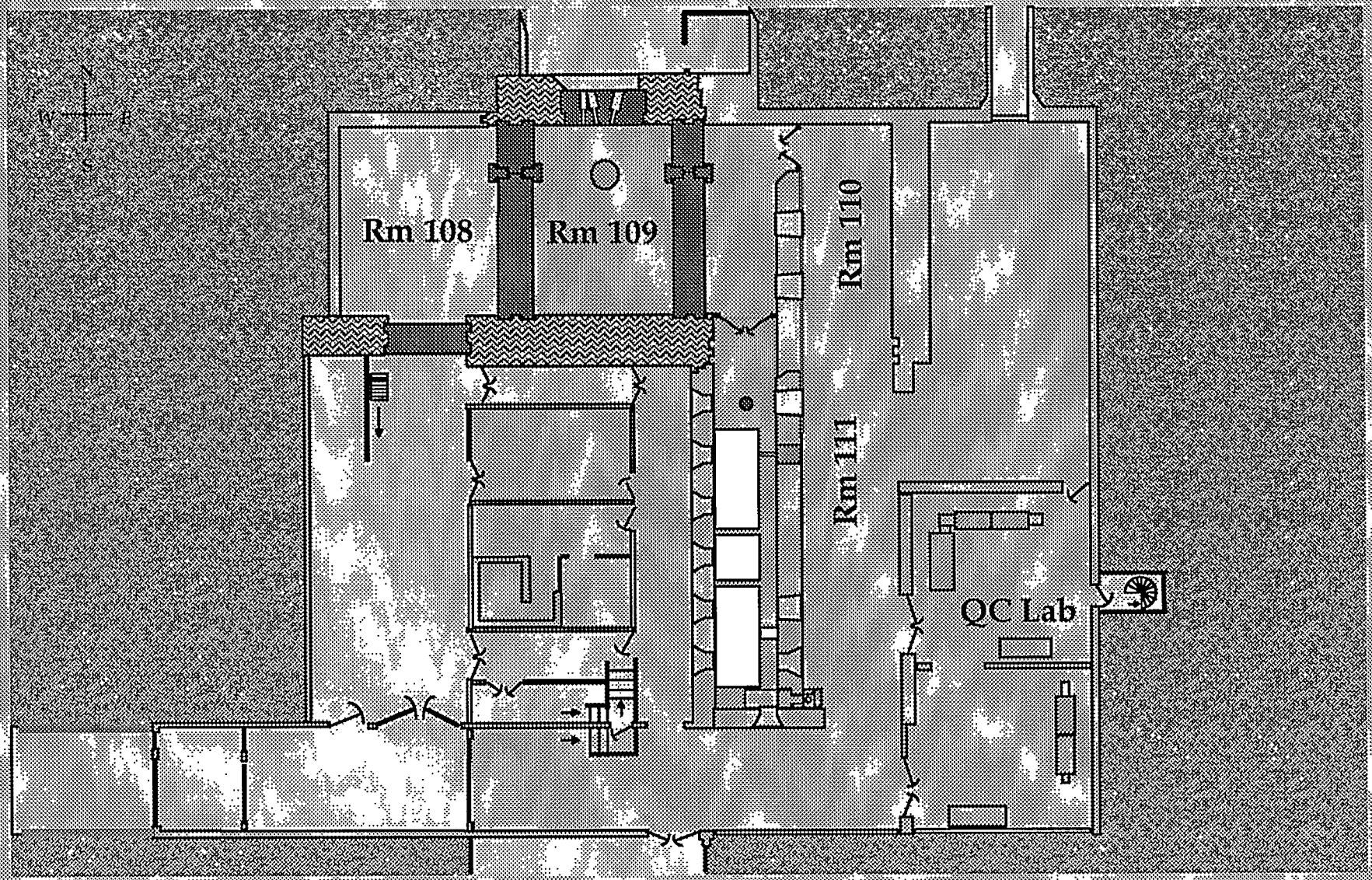


**Figure 2: Hot Cell configuration with $^{99}Mo$ FY98 modifications**