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INTERPRETATION: IIAR SC 2021-1, IIAR 9 – Spark Resistant Construction of Existing Exhaust Fans.

FINALIZED: Upon publication of IIAR 2-2021

SUBJECT: Applicability of non-spark resistant fan construction to IIAR 9.

BACKGROUND: IIAR 2-2014 required that all exhaust fans in a machinery room be constructed with non-sparking blades. IIAR 9-2020 reflected this requirement when it was developed. IIAR 2-2021 removed the requirement for all exhaust fans in a machinery room to be equipped with non-sparking blades. Instead, IIAR 2-2021, Section 6.14.3.5 requires that "emergency exhaust fans be constructed such that a shift of the impeller or shaft will not permit two ferrous parts of the fan to rub or strike." In essence this permits the use of steel constructed general exhaust fans. However, Section 6.14.2 requires that fans that are not emergency exhaust fans shut off when ammonia concentration is 150 ppm. An exception is provided for Section 6.14.2. "EXCEPTION: Exhaust fans that are not designated as emergency exhaust fans are permitted to remain energized upon detection of ammonia in accordance with section 6.13.3. Such exhaust fans shall be in accordance with Sections 6.14.3.2 through 6.14.3.6." This exception will permit exhaust fans that are not designated as emergency exhaust fans to remain on, but only if they are constructed and arranged like emergency exhaust fans. In effect, they will become emergency exhaust fans, contributing to the emergency ventilation rate.

QUESTION 1: If an existing facility uses the provisions in IIAR 2-2021, Section 6.14.3 and has non-emergency exhaust fans that are not constructed like emergency exhaust fans, but will shut off when an ammonia concentration of 150 ppm is detected, will the facility be in violation of IIAR 9 that requires all exhaust fans in a machinery room, regardless of function, to have non-sparking blades?

ANSWER 1: No. A facility will be compliant if a facility's exhaust fan arrangement is operated according to IIAR 2-2021, Section 6.14.2 or designed and

constructed in accordance with IIAR 9. IIAR 2-2021 requires that non-emergency exhaust fans shut off when ammonia concentrations reach 150 ppm. The IIAR Standards Committee asserts that this mitigates the chances of a non-spark resistant fan igniting released ammonia similarly to fans equipped with spark-resistant blades, noting that the lower flammability of ammonia is 160,000 parts per million. The exception in IIAR 2-2021, Section 6.14.2 permits exhaust fans to remain on upon detection of 150 ppm, but only if they are constructed and arranged in the same manner as emergency exhaust fans.

IIAR standards are maintained on a 5 year periodic basis. When IIAR standards are updated, the Standards Committee coordinates requirements of the various standards where applicable to eliminate conflicts or perceived conflicts. Interpretations are used to modify or explain standards content as necessary between standards revision efforts.

COMMITTEE ACTION:

Upon the next revision of IIAR 9, change the requirement that all exhaust fans must be equipped with non-sparking blades. The new requirement(s) will align with IIAR 2.