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INTERPRETATION: IIAR SC 2020-2

FINALIZED: August 24, 2020

SUBJECT: Replacement Frequency of Internally Relieving Pressure-Relief Valves

BACKGROUND: IIAR-6 2019, Chapter 13, addresses inspection, testing, maintenance (ITM) and/or replacement of pressure relief valves. Most of the chapter addresses ITM of atmospheric pressure-relief valves. But Section 13.1.4 says "Hydrostatic/Internal PRVs that relieve internal to another portion of the closed-circuit system shall be maintained in accordance with the manufacturer's recommendations."

QUESTION 1: Historically, liquid pressure-relief valves or vapor pressure-relief valves that relieve into another part of the closed-circuit refrigeration system (internally-relieved) have not been subject to periodic replacement (see IIAR Bulletin 110), requiring attention only when there are indications of a failure. Because these valves are not subject to internal corrosion, they are also less likely to fail than those relieving to atmosphere. And even if they do fail internally, the consequences are not severe because the discharge is back into the system. Evidence and research guide the requirements for testing and replacement of atmospheric pressure-relief valves, but similar evidence and research does not exist for pressure-relief valves that discharge internal to the system. IIAR 6-2019, Section 13.1.4, essentially changed the ITM requirements for internally relieved hydrostatic or vapor pressure-relief valves, to rely on manufacturer's recommendations only, who may have unjustifiable reasons to recommend replacement at frequencies greater than necessary. Does IIAR know of any reason to specify replacement of internally relieved liquid or vapor pressure-relief valves when there is no indication of failure or pending failure?

ANSWER 1: The IIAR Standards Committee and Safety Committee has reviewed the historic ITM guidance on pressure-relief valves (PRVs) that discharge into other parts of a closed-circuit ammonia refrigeration system. IIAR committees have also queried their membership, associates, and pressure-relief valve manufacturers for historic or anecdotal incidents of internally-relieved PRV failure that has caused unsafe conditions. No such incidents

were reported. External corrosion or operational failure might occur which would guide the repair or replacement of any pressure-relief valve. But internal failure of PRVs that relieve internal to a system would not cause unsafe conditions. If these PRVs fail internally, they will still maintain their safety function of relieving high pressure conditions in the portion of the systems they protect although this might cause temperature and/or pressure fluctuations or increased energy use.

COMMITTEE ACTION: Change IIAR 6 during the next scheduled revision to reflect the position reflected in this interpretation.