| | |
|---|---|
| **Firm Name, City & State:** | **FEI Number:** |
| **Inspection Date(s):** | **FCE Number:** |
| **Investigators:** | |

DEPARTMENT OF HEALTH AND HUMAN SERVICES
FOOD AND DRUG ADMINISTRATION

# PROCESSING IN WATER IN DISCONTINUOUS AGITATING RETORTS
## (Retort Survey)

### INSTRUCTIONS

This report covers batch-type agitating retort systems pressure processing in water with overriding air or steam. This includes the traditional rotating systems specifically covered under 113.40(e) as well as other axial and end-over-end processing systems covered by 113.40(j), "Other Systems."

Complete the question blocks below. Narrative responses to each item can be entered in the item's "comments" area or where otherwise prompted. Draw a diagram of the retort or obtain one from the firm. Attach the diagram to the EIR as an exhibit. Measure and verify retort plumbing – record on this form. Report all pipe sizes as inside diameter (ID). Refer to 21 CFR Part 113.40(e) and pp. 32-34 of LACF Guide, Part 2.

**Before entering the interior of the retort, you must confirm with the firm that you are following the firm's Standard Operating Procedures designed to meet OSHA confined space requirements. If the firm insists that only plant personnel enter the retort, witness the measurement procedure and data collection. To obtain OSHA confined space information and safety procedures, see the confined space presentation on the FDA ORAU web site. If the firm is not aware of the OSHA confined space requirements or does not have a confined space program, DO NOT ENTER THE RETORT.**

If problems are found with the firm's retort equipment or processing system, refer the reader to the Turbo EIR for a narrative description of specific problems with supporting evidence, under "Objectionable Conditions and Management's Response." Submit the completed form as an EIR attachment.

### RETORT DESCRIPTION

| RETORT NO. & DIMENSIONS | *CAN SIZE | COOKER CAPACITY | STEPS/REEL |
|---|---|---|---|
| | PROCESSING MODE<br>Axial ☐ End-over-End ☐ | | |

* List the can size covered during the inspection.

### COMPUTER CONTROLS

DOES A COMPUTER CONTROL ANY OF THE RETORT FUNCTIONS? ..... Yes ☐ No ☐

EXPLAIN:

DOES THE FIRM HAVE DOCUMENTATION ON HAND WHICH INDICATES THAT THE COMPUTER SYSTEM HAS BEEN VALIDATED? ..... Yes ☐ No ☐

EXPLAIN:

IS RECORD KEEPING PART OF THE COMPUTER FUNCTION? ..... Yes ☐ No ☐

IF YES, DOES THE RECORD KEEPING COMPLY WITH 21 CFR PART 11? ..... Yes ☐ No ☐

COMMENTS:

## AGITATION

IS THE AGITATING RETORT OPERATED IN THE STILL MODE? ..... Yes ☐ No ☐

COMMENTS:

IF CRATES ARE USED, IS THE CRATE POSITION CRITICAL TO THE COME-UP AND/OR PROCESS? ..... Yes ☐ No ☐

COMMENTS:

IF CRATE POSITION HAS BEEN DETERMINED AS CRITICAL TO THE PROCESS, WHAT IS THE RECOMMENDED POSITION AND HOW WAS IT DETERMINED? (FOR EXAMPLE, PROCESS ESTABLISHMENT TESTS MAY HAVE DETERMINED THAT AN ANGLED CRATE POSITION RESULTS IN FASTER HEAT PENETRATION.)

## PROCESSING WATER

METHOD USED TO HEAT PROCESS WATER:

A. Steam Injection into Process Water ☐ B. Heat Exchanger ☐ C. Steam Spreader ☐ D. Other ☐

IF OTHER, EXPLAIN:

## WATER DRAINS

ARE SCREENS USED OVER ALL DRAIN OPENINGS TO PREVENT CLOGGING OF DRAINS? ..... Yes ☐ No ☐

COMMENTS:

IS THE DRAIN LINE VALVE WATER TIGHT AND NON-CLOGGING? ..... Yes ☐ No ☐

COMMENTS:

## WATER DISTRIBUTION

WATER DISTRIBUTION SYSTEM:

Manifold Plate? ..... Yes ☐ No ☐

Spray Nozzle Heads? ..... Yes ☐ No ☐

Manifold Pipe? ..... Yes ☐ No ☐

Other? ..... Yes ☐ No ☐

IF OTHER, EXPLAIN:

DESCRIBE HOLE SIZE AND DISTRIBUTION IN MANIFOLD/SPRAY NOZZLES:

HAVE HOLE SIZES BEEN ALTERED BY PRODUCT OR MINERAL BUILD-UP? ..... Yes ☐ No ☐

COMMENTS:

DOES THE FIRM HAVE A CLEANING PROGRAM FOR THE WATER DISTRIBUTION SYSTEM? ..... Yes ☐ No ☐

COMMENTS:

HOW DOES THE FIRM ENSURE THAT WATER FLOW IS CONSTANT?

Visual Checks ..... Yes ☐ No ☐

Water Flow Measurement ..... Yes ☐ No ☐

Flow Meter ..... Yes ☐ No ☐

COMMENTS:

HOW OFTEN IS WATER FLOW CHECKED?

WHAT IS THE WATER FLOW RATE?

DESCRIBE THE PROCEDURE TO ENSURE WATER FLOW IS MAINTAINED:

PROVIDE THE WATER FLOW METER MODEL NUMBER AND LOCATION:

AT WHAT POINT DOES WATER ENTER THE RETORT WATER DISTRIBUTION SYSTEM?

Back Top ..... Yes ☐ No ☐

Back Bottom ..... Yes ☐ No ☐

Front Top ..... Yes ☐ No ☐

Front Bottom ..... Yes ☐ No ☐

Center ..... Yes ☐ No ☐

Multiple ..... Yes ☐ No ☐

COMMENTS:

EXPLAIN THE WATER DISTRIBUTION SYSTEM:

DESCRIBE THE WATER RETURN SYSTEM:

ARE WATER RETURN INLETS SCREENED? ..... Yes ☐ No ☐

EXPLAIN, IF NECESSARY:

IS THE PROCESSING WATER REUSED? ..... Yes ☐ No ☐

EXPLAIN, IF NECESSARY:

IF WATER IS REUSED DURING THERMAL PROCESSING, WHAT IS THE RECIRCULATION RATE?

WHAT IS THE CAPACITY OF THE WATER PUMP (GPM/LPM)?

IS WATER FLOW IDENTIFIED AND CONTROLLED AS A FACTOR CRITICAL TO THE THERMAL PROCESS?..... Yes ☐ No ☐

COMMENTS:

ARE WATER FLOW PROBLEMS HANDLED AS PROCESS DEVIATIONS? ..... Yes ☐ No ☐

COMMENTS:

DURING THE INSPECTION, WAS THERE ANY EVIDENCE OF LOW WATER FLOW?..... Yes ☐ No ☐

COMMENTS:

## COOLING WATER SUPPLY

IS PROCESSING WATER USED TO COOL CONTAINERS DURING THE COOLING CYCLE?..... Yes ☐ No ☐

COMMENTS:

IF WATER IS INTRODUCED FROM AN EXTERIOR SOURCE DURING COOLING,
IS THE WATER COOLING LINE EQUIPPED WITH A CHECK VALVE? ..... Yes ☐ No ☐ N/A ☐

COMMENTS:

## INDICATING MERCURY-IN-GLASS THERMOMETERS (113.40(e)(1))

IS THE RETORT EQUIPPED WITH AT LEAST ONE MERCURY-IN-GLASS (MIG) THERMOMETER? ..... Yes ☐ No ☐

COMMENTS:

IS THE RETORT EQUIPPED WITH A TEMPERATURE INDICATING DEVICE OTHER
THAN A MIG THERMOMETER? ..... Yes ☐ No ☐

IF YES, DESCRIBE THE INDICATOR:

ARE SCALE DIVISIONS EASILY READABLE TO 1°F (.5°C)? ..... Yes ☐ No ☐

NO. OF DEGREES F OR C/IN. OF GRADUATED SCALE: _____. *(TEMP. RANGE MUST NOT EXCEED 17°F (8°C) PER INCH (4°C PER CM) OF GRADUATED SCALE. SEE LACF GUIDE, P. 14.)*

DATE LAST TESTED FOR ACCURACY: _____ .

COMMENTS:

STANDARD USED FOR THE TEST:

NAME AND TITLE OF PERSON WHO PERFORMED TEST:

IS THE LAST TEST DATE IDENTIFIED ON THE THERMOMETER? ..... Yes ☐ No ☐

WERE CALIBRATING TEST RECORDS PREPARED AND MAINTAINED? ..... Yes ☐ No ☐

COMMENTS:

DESCRIBE THE FIRM'S ACTIONS REGARDING MIG THERMOMETERS THAT WERE OUT OF CALIBRATION:

IS THE MERCURY UNDIVIDED? ..... Yes ☐ No ☐

*(A THERMOMETER THAT HAS A DIVIDED MERCURY COLUMN OR THAT CANNOT BE ADJUSTED TO THE STANDARD **SHALL** BE REPAIRED OR REPLACED.)*

COMMENTS:

WHEN MIG THERMOMETERS ARE FOUND TO BE PROVIDING READINGS ABOVE THE ACTUAL TEMPERATURES, DOES THE FIRM EVALUATE PRODUCTS PRODUCED USING THOSE THERMOMETERS? ..... Yes ☐ No ☐

DESCRIBE THE FIRM'S PROCEDURES:

IS THE THERMOMETER LOCATED WHERE IT IS EASY TO READ ACCURATELY? ..... Yes ☐ No ☐

*(**SHALL** REQUIREMENT)*

COMMENTS:

THE SENSOR BULB IS LOCATED IN THE ..... Retort Shell ☐ , or External Well ☐

*(**SHALL** REQUIREMENT)*

COMMENTS:

IS THE MERCURY THERMOMETER USED AS THE REFERENCED INSTRUMENT DURING PROCESSING? ..... Yes ☐ No ☐

*(**SHALL** REQUIREMENT)*

COMMENTS:

## TEMPERATURE RECORDER (113.40(e)(2))

TYPE OF TEMPERATURE RECORDER ..... Round Circular Chart ☐ Strip Chart ☐ Other ☐

IF OTHER, EXPLAIN:

DO THE CHART SPECIFICATIONS MEET THE REQUIREMENTS OF PART 113.40(e)(2)? ..... Yes ☐ No ☐

*(GRADUATIONS ON THE TEMPERATURE RECORDING DEVICE **SHALL** NOT EXCEED 2°F (1°C) WITHIN A RANGE OF 10°F (5.5°C) OF THE PROCESSING TEMPERATURE. EACH CHART **SHALL** HAVE A WORKING SCALE OF NOT MORE THAN 55°F/IN. (12°C/CM) WITHIN A RANGE OF 20°F (10°C) OF THE PROCESSING TEMPERATURE – 113.40(e)(2). ALSO, SEE P. 14 OF LACF GUIDE, PART 2.)*

*COMMENTS:*

IS THE TEMPERATURE CHART ADJUSTED TO AGREE AS NEARLY AS POSSIBLE WITH BUT NOT HIGHER THAN THE KNOWN ACCURATE MERCURY-IN-GLASS (MIG) THERMOMETER DURING THE PROCESSING PERIOD? ..... Yes ☐ No ☐

*(**SHALL** REQUIREMENT – NOTE ANY DIFFERENCE BETWEEN THE RECORDING THERMOMETER AND THE MIG THERMOMETER AND WHICH READING IS HIGHER.)*

COMMENTS:

IS THERE A MEANS OF PREVENTING UNAUTHORIZED ADJUSTMENTS? ..... Yes ☐ No ☐

*(A MEANS OF PREVENTING UNAUTHORIZED CHANGES IN ADJUSTMENTS **SHALL** BE PROVIDED. A LOCK OR NOTICE FROM MANAGEMENT STATING "ONLY AUTHORIZED PERSONS ARE PERMITTED TO MAKE ADUSTMENTS," POSTED AT OR NEAR THE RECORDING DEVICE, IS A SATISFACTORY MEANS OF PREVENTING UNAUTHORIZED CHANGES.)*

COMMENTS:

IS THE CHART DRIVE TIMING MECHANISM ACCURATE? ..... Yes ☐ No ☐

IF NO, EXPLAIN:

IS THE RECORDER COMBINED WITH A TEMPERATURE (STEAM) CONTROLLER TO FUNCTION AS A RECORDING/CONTROLLING INSTRUMENT? ..... Yes ☐ No ☐

COMMENTS:

## TEMPERATURE CONTROLLER

HOW IS TEMPERATURE CONTROLLED IN THE RETORT?

Recorder Controller ☐ CAM Controller ☐ Manual Switching ☐ Computer ☐

COMMENTS:

REPORT THE **MANUFACTURER**, **MODEL**, **TYPE** AND **SIZE** OF THE AUTOMATIC STEAM CONTROL VALVE:

IF THE TEMPERATURE (STEAM) CONTROLLER IS AIR OPERATED, DOES THE SYSTEM HAVE AN ADEQUATE FILTER TO ASSURE A SUPPLY OF CLEAN, DRY AIR? ..... Yes ☐ No ☐

*(AIR OPERATED TEMPERATURE CONTROLLERS **SHOULD** HAVE ADEQUATE FILTER SYSTEMS TO ASSURE A SUPPLY OF CLEAN, DRY AIR – 113.40(e)(2).)*

COMMENTS:

## COME-UP PROCEDURE

DESCRIBE THE FIRM'S PROCEDURE TO BRING THE RETORT UP TO PROCESSING TEMPERATURE. INCLUDE TIME, TEMPERATURE AND NUMBER OF STEPS:

CAN THE FIRM DOCUMENT ALL STEPS OF THE COME-UP PROCEDURE? ..... Yes ☐ No ☐

COMMENTS:

DOES THE FIRM IDENTIFY PROCESS COME-UP STEPS AS CRITICAL ON THE PROCESSING FILING FORMS? .... Yes ☐ No ☐

*(NOTE – PROCESSING STEPS ARE REQUIRED ON THE PROCESS FILING FORM WHEN THEY HAVE BEEN IDENTIFIED AS CRITICAL TO THE THERMAL PROCESS. THIS IS ALWAYS THE CASE WHEN THE GENERAL METHOD IS USED TO CALCULATE THE $F_O$.)*

## AIR PURGE

IN SOME SYSTEMS, AN AIR PURGE (VENT VALVE) IS USED TO ENHANCE WATER ENTRY INTO THE PROCESSING VESSEL; IS AN AIR PURGE VALVE USED ON THE PROCESSING VESSEL? ..... Yes ☐ No ☐

COMMENTS:

HAS TIMING OF THE AIR PURGE VALVE (TIME OPEN) BEEN IDENTIFIED AS CRITICAL TO ADEQUATE TEMPERATURE DISTRIBUTION IN THE RETORT? ..... Yes ☐ No ☐

COMMENTS:

## HEATED PROCESS WATER

IS WATER PRE-HEATED IN A SEPARATE VESSEL PRIOR TO PROCESSING? ..... Yes ☐ No ☐

IS THE WATER TEMPERATURE OF THE PRE-HEATED WATER CRITICAL TO TEMPERATURE DISTRIBUTION IN THE RETORT? ..... Yes ☐ No ☐

COMMENTS:

DESCRIBE THE TEMPERATURE REQUIREMENTS FOR PRE-HEATED WATER:

DID THE FIRM MEET THE REQUIREMENTS FOR PRE-HEATING WATER DURING THIS INSPECTION? ..... Yes ☐ No ☐

EXPLAIN:

## RETORT PLUMBING AND EQUIPMENT ISSUES

WHEN WAS THE LAST MAJOR OVERHAUL OR MAINTENANCE PERFORMED ON THE RETORTS?

COMMENTS:

DOES THE FIRM CONDUCT A RETORT SURVEY PERIODICALLY *(YEARLY)*, OR AFTER A MAJOR RETORT OVERHAUL OR AFTER MAINTENANCE IS PERFORMED ON CRITICAL EQUIPMENT *(RETORTS, FILLER, BOILER CONFIGURATION, ETC.)*? A RETORT SURVEY IS NOT REQUIRED BY THE REGULATIONS, BUT IS COMMONLY USED TO DOCUMENT THAT A FIRM'S PROCESSING SYSTEM IS IN COMPLIANCE WITH FDA REGULATIONS AND THAT THE SYSTEM MEETS THE SAME CRITERIA *(VALVE TYPE, STEAM SPREADER CONFIGURATION, ETC.) AS WHEN TEMPERATURE DISTRIBUTION STUDIES WERE CONDUCTED.*

COMMENTS:

DO THE BOILERS SUPPLY SUFFICIENT STEAM TO THE RETORTS? IS THERE SUFFICIENT PRESSURE IN THE HEADER PIPE SUPPLYING STEAM TO THE RETORTS, ESPECIALLY WHEN MORE THAN ONE RETORT IS BEING VENTED SIMULTANEOUSLY?

COMMENTS:

## TEMPERATURE DISTRIBUTION

HAVE TEMPERATURE DISTRIBUTION STUDIES BEEN PERFORMED ON THE FIRM'S RETORTS? ..... Yes ☐ No ☐

IF SO, WHO CONDUCTED THE STUDY, WHAT PROCEDURES WERE FOLLOWED AND WHO EVALUATED THE DATA?

IS THERE DOCUMENTATION SUCH AS A RETORT DIAGRAM AND PARAMETERS USED TO VALIDATE THE TESTS? ..... Yes ☐ No ☐

*(FOR AN EXPLANATION OF TEMPERATURE DISTRIBUTION, SEE P. 21 OF LACF GUIDE, PART 2. SPECIAL CONSIDERATIONS FOR CONDUCTING TEMPERATURE DISTRIBUTION STUDIES IN STEAM-AIR RETORTS ARE LISTED IN FORM 3511(h).)*

COMMENTS:

DATE OF LAST TEMPERATURE DISTRIBUTION STUDY:

HAS A TEMPERATURE DISTRIBUTION STUDY BEEN PERFORMED ON EACH INDIVIDUAL RETORT? ..... Yes ☐ No ☐

COMMENTS:

HAS A TEMPERATURE DISTRIBUTION STUDY BEEN PERFORMED ON EACH CONTAINER SIZE? ..... Yes ☐ No ☐

COMMENTS:

HAS A TEMPERATURE DISTRIBUTION STUDY BEEN PERFORMED ON EACH CONTAINER TYPE? *(E.G., GLASS, METAL, PLASTIC)* ..... Yes ☐ No ☐

COMMENTS:

HAS A TEMPERATURE DISTRIBUTION STUDY BEEN PERFORMED ON EACH PRODUCT OR PRODUCT TYPE? ..... Yes ☐ No ☐

COMMENTS:

HAVE TEMPERATURE DISTRIBUTION STUDIES BEEN PERFORMED TO DETERMINE THE EFFECTS OF TEMPERATURE DROPS DURING COME-UP AND PROCESSING? ..... Yes ☐ No ☐

REPORT RESULTS:

ARE PARTIAL LOADS PROCESSED IN THE FIRM'S RETORTS? ..... Yes ☐ No ☐

COMMENTS:

HAVE THERE BEEN ANY CHANGES TO THE RETORTS OR THERMAL PROCESSING SYSTEM SINCE THE LAST TEMPERATURE DISTRIBUTION STUDY THAT COULD AFFECT TEMPERATURE DISTRIBUTION? ..... Yes ☐ No ☐

*(THE RETORT DESIGN, LOADING CONFIGURATION, SMALLEST CONTAINER SIZE AND MANY OTHER FACTORS CAN AFFECT THE ATTAINMENT OF TEMPERATURE DISTRIBUTION IN THE RETORT – SEE PP. 21-22 OF LACF GUIDE, PART 2. A CHANGE IN ANY OF THESE FACTORS COULD NECESSITATE A NEW TEMPERATURE DISTRIBUTION STUDY AND POSSIBLY A NEW VENT SCHEDULE. IF A CHANGE HAS BEEN MADE IN THE THERMAL PROCESSING SYSTEM THAT COULD AFFECT TEMPERATURE DISTRIBUTION, THE FIRM* ***SHOULD*** *HAVE ON FILE DOCUMENTATION OF THE CHANGE, INCLUDING THE REVIEW AND APPROVAL BY A QUALIFIED PROCESS AUTHORITY.)*

COMMENTS:

## RETORT CRATES AND RACKS

DESCRIBE THE RETORT CRATES:

DIMENSIONS:

NUMBER OF HOLES:

SIZE OF HOLES:

LOCATION OF HOLES:

CRATES/BASKETS NOT USED ☐

COMMENTS:

ARE CONTAINERS POSITIONED IN THE RETORT AS SPECIFIED IN THE SCHEDULED PROCESS? ..... Yes ☐ No ☐

COMMENTS:

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ARE DIVIDERS, TRAYS, RACKS OR OTHER MEANS OF POSITIONING FLEXIBLE CONTAINERS DESIGNED AND EMPLOYED TO ENSURE EVEN CIRCULATION OF HEATING MEDIUM AROUND ALL CONTAINERS? ..... Yes ☐ No ☐

COMMENTS:

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ARE DIVIDER PLATES USED? ..... Yes ☐ No ☐

DESCRIBE THE NUMBER OF HOLES AND DISTRIBUTION IN DIVIDER PLATES:

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IS THE SAME TYPE OF DIVIDER PLATE USED FOR ALL CONTAINERS? ..... Yes ☐ No ☐ N/A ☐

COMMENTS:

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ARE CONTAINERS PROCESSED WITHOUT DIVIDER PLATES? ..... Yes ☐ No ☐

COMMENTS:

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CONTAINER NESTING WHERE ONE CONTAINER OR MORE ARE POSITIONED ONE INSIDE ANOTHER TO REPRESENT A MUCH LARGER CONTAINER MAY OCCUR WITH PRODUCTS DESIGNED TO STACK ON STORE SHELVES (E.G., TUNA, SARDINES).

IS CONTAINER NESTING POSSIBLE? ..... Yes ☐ No ☐

HOW DOES THE FIRM CONTROL NESTING OF CONTAINERS?

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WAS CONTAINER NESTING EVALUATED AS PART OF THE PROCESS ESTABLISHMENT? ..... Yes ☐ No ☐

COMMENTS:

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WHICH OF THE FOLLOWING CONTAINER TYPES ARE PROCESSED?

Metal Cans ☐ Glass Jars ☐ Pouches ☐ Rigid Plastic ☐

COMMENTS:

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DOES THE FIRM PROCESS MORE THAN ONE CONTAINER SIZE? ..... Yes ☐ No ☐

LIST ALL CONTAINER SIZES:

METAL CANS _____

GLASS JARS _____

POUCHES _____

RIGID PLASTIC _____

IF MORE THAN ONE CONTAINER SIZE OR TYPE IS PROCESSED AT ONE TIME, DESCRIBE PROCEDURES USED:

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FOR POUCHES, ARE TRAYS ADEQUATELY DESIGNED WITH POCKETS TO CONTAIN AND RESTRAIN INDIVIDUAL POUCHES DURING PROCESSING? ..... Yes ☐ No ☐

COMMENTS:

ARE TRAYS OR DIVIDER PLATES IN GOOD CONDITION WITH NO SHARP OR ROUGH POINTS THAT COULD PUNCTURE CONTAINERS? ..... Yes ☐ No ☐

COMMENTS:

## PRESSURE CONTROL

ARE PRODUCTS PRODUCED USING OVER-PRESSURE? ..... Yes ☐ No ☐

IF YES, WHAT OVER-PRESSURE IS ACHIEVED?

IS THE RETORT EQUIPPED WITH A PRESSURE GAGE? ..... Yes ☐ No ☐

COMMENTS:

IS A MEANS PROVIDED FOR INTRODUCING COMPRESSED AIR OR STEAM AT THE PROPER PRESSURE AND RATE? ..... Yes ☐ No ☐

COMMENTS:

IS THE PRESSURE IN THE RETORT CONTROLLED BY AN AUTOMATIC PRESSURE CONTROL UNIT? ..... Yes ☐ No ☐

*(**SHALL** REQUIREMENT)*

COMMENTS:

IF A PRESSURE GAGE IS PRESENT ON THE RETORT COOKER SHELL, IS IT GRADUATED IN DIVISIONS OF 2 LBS. OR LESS? ..... Yes ☐ No ☐

*(NOTE – THIS IS A RECOMMENDATION: **SHOULD** REQUIREMENT – 113.40(e)(3).)*

COMMENTS:

DESCRIBE THE LOCATION WHERE COMPRESSED AIR OR STEAM ENTERS THE RETORT:

IS COMPRESSED AIR USED FOR OVER-PRESSURE HEATED PRIOR TO INTRODUCTION INTO THE RETORT? ..... Yes ☐ No ☐ N/A ☐

COMMENTS:

IS A DIFFUSER USED ON THE COMPRESSED AIR ENTRY LINE TO ENSURE RAPID MIXING OF THE AIR IN THE RETORT ATMOSPHERE? ..... Yes ☐ No ☐

COMMENTS:

HAS THE POINT WHERE AIR ENTERS THE RETORT BEEN IDENTIFIED AS A COLD SPOT IN THE RETORT? ..... Yes ☐ No ☐ N/A ☐

COMMENTS:

EXPLAIN HOW PRESSURE IS CONTROLLED IN THE RETORT:

HAS OVER-PRESSURE BEEN IDENTIFIED AS CRITICAL TO THE THERMAL PROCESS? ..... Yes ☐ No ☐

COMMENTS:

ARE PRESSURE DROPS CONSIDERED PROCESS DEVIATIONS? ..... Yes ☐ No ☐

WHY OR WHY NOT? *(AND ANY OTHER COMMENTS)*

## RETORT SPEED TIMING (113.40(e)(5))

IS THE ROTATIONAL SPEED OF THE RETORT SPECIFIED IN THE SCHEDULED PROCESS? ..... Yes ☐ No ☐

*(**SHALL** REQUIREMENT)*

COMMENTS:

IS THE ROTATIONAL SPEED OF THE RETORT ADJUSTED, AS NECESSARY,
TO ENSURE THAT THE SPEED IS AS SPECIFIED IN THE SCHEDULED PROCESS? ..... Yes ☐ No ☐

*(**SHALL** REQUIREMENT)*

COMMENTS:

IS THE ROTATIONAL SPEED OF THE RETORT AND THE PROCESS TIME RECORDED FOR EACH RETORT LOAD PROCESSED?

PROCESS TIME ..... Yes ☐ No ☐

ROTATIONAL SPEED ..... Yes ☐ No ☐

*(**SHALL** REQUIREMENT)*

IF NO, IS A RECORDING TACHOMETER USED TO PROVIDE A CONTINUOUS RECORD OF THE SPEED? ..... Yes ☐ No ☐

*(**SHALL** REQUIREMENT)*

IF NO TO THE ABOVE 2 QUESTIONS, HOW DOES THE FIRM MONITOR AND RECORD THE RETORT SPEED AND PROCESS TIME OF EACH RETORT LOAD PROCESSED?

OTHER COMMENTS:

DOES THE FIRM HAVE A MEANS OF PREVENTING UNAUTHORIZED SPEED CHANGES ON THE RETORT? ..... Yes ☐ No ☐

*(**SHALL** REQUIREMENT – A LOCK OR NOTICE FROM MANAGEMENT, POSTED AT OR NEAR THE SPEED ADJUSTMENT DEVICE WHICH PROVIDES A WARNING THAT ONLY AUTHORIZED PERSONS ARE PERMITTED TO MAKE ADJUSTMENTS, IS A SATISFACTORY MEANS OF PREVENTING UNAUTHORIZED CHANGES.)*

COMMENTS:

EXPLAIN HOW THE RETORT ROTATIONAL SPEED IS MONITORED AND RECORDED:

## OTHER CONCERNS AND OBSERVATIONS

EXPLAIN ANY OTHER CONCERNS WITH THE OPERATION OF THIS RETORT SYSTEM: