Proposed Rule 1407.1

Control of Emissions of Toxic Air Contaminants from Alloy Steel, Chromium Alloy, Stainless Steel, and Superalloy Melting Operations

Public Workshop

August 30, 2018

Background

Regulatory History

1992
CARB Adopted Air Toxic Control Measure (ATCM) for Non-Ferrous Metal Melting

- Focused on non-ferrous metal melting operations because of known presence of arsenic and cadmium
- Ferrous metals not included; beyond scope of investigation
- CARB intended to evaluate the need for controls for ferrous metal melting operations in the future

1994
SCAQMD Adopted Rule 1407 – Control of Arsenic, Cadmium, and Nickel from Non-Ferrous Metal Melting Operations

- Rule 1407 implements CARB's ATCM for non-ferrous metal melting
- Required the reduction of arsenic, cadmium, and nickel by the installation of air pollution control equipment, parametric monitoring and housekeeping practices

2017
2016 Air Quality Management Plan

- Control measure identifies need to address:
  - Toxic air contaminant emissions from ferrous metal melting operations; and
  - Update existing requirements for non-ferrous metal melting operations

Need for Proposed Rule 1407.1

- Currently alloy steel and stainless steel are not regulated under a source-specific rule to address toxic air contaminant emissions and superalloys are regulated by Rule 1407, but are exempt
  - Alloy steel, stainless steel, and superalloys contain chromium in high concentrations relative to other ferrous and non-ferrous metals
  - These alloys may also contain other toxic air contaminants including arsenic, cadmium, and nickel
- SCAQMD has source test data from metal melting and heat treating operations that provide confirmation that hexavalent chromium emissions do occur from these operations
  - These operations are either lower in temperature or lower in chromium concentration than melting operations of alloy steel, stainless steel, and superalloys
  - It is expected that at higher temperatures and higher chromium concentrations, more hexavalent chromium emissions will occur

Hexavalent Chromium Emissions Data

Ambient Monitoring in Paramount

- Conducted in 2016 and 2017
- Indicated that hexavalent chromium was being emitted by high-temperature metalworking operations

Screening Tests on Heat Treating Furnaces

- Conducted in 2016 and 2017
- Results showed hexavalent chromium in exhaust of heat treating furnaces processing metals or using materials that contain chromium

Source Tests from Metal Melting Operations

- Conducted in 1993
- Source test showed some chromium is converted to hexavalent chromium during carbon steel metal melting operations

Literature from Other Agencies

- Worker exposure can occur during "hot work" of steels containing chromium*
- At high temperatures, hexavalent chromium is formed as a by-product when metals containing chromium are processed**

* https://www.osha.gov/SLTC/hexavalentchromium/

** https://www.cdc.gov/niosh/docs/2013-128/pdfs/2013_128.pdf

Objectives of Proposed Rule 1407.1

Gather Information and Quantify Toxic Air Contaminant Emissions

- Further testing is needed to assess toxic air contaminant emissions from melting operations of alloy steel, stainless steel, superalloys, or any chromium alloy containing greater than 0.5% chromium

Assess Information

- To determine appropriate pollution controls needed to reduce toxic air contaminant emissions from those operations

Preliminary Draft Rule Language

Overview

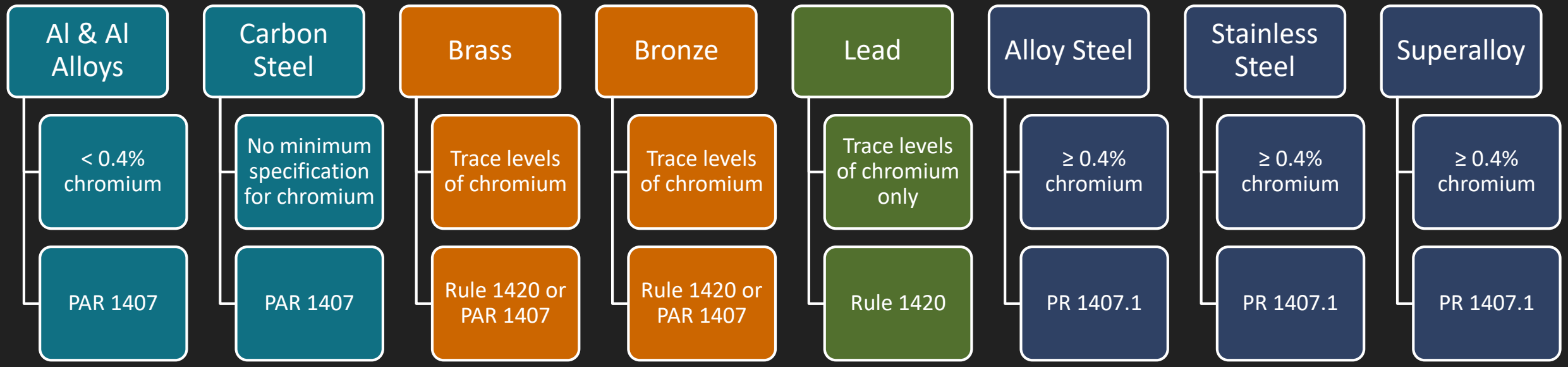
- Rule language provides the details necessary for implementation of the rule
- Rule language based on initial rule concepts with input from stakeholders
- Presentation will highlight key provisions of preliminary draft rule language

Purpose (subdivision (a))

- Purpose:
  - Gather toxic air contaminant emissions from chromium alloy melting operations
  - Quantify particulate and toxic air contaminant emissions from chromium alloy melting operations
- Quantification and information needed because:
  - Chromium alloys contain toxic air contaminants, such as arsenic, cadmium, and nickel, which have the potential to be emitted during metal melting operations
  - Chromium alloys contain chromium, which has the potential to be converted to hexavalent chromium and emitted during metal melting operations
  - Additional data is needed to quantify the type and amount of toxic air contaminant emissions that occurs during the melting process
  - Data from Proposed Rule 1407.1 provides information to assess additional requirements for chromium metal melting operations, if any

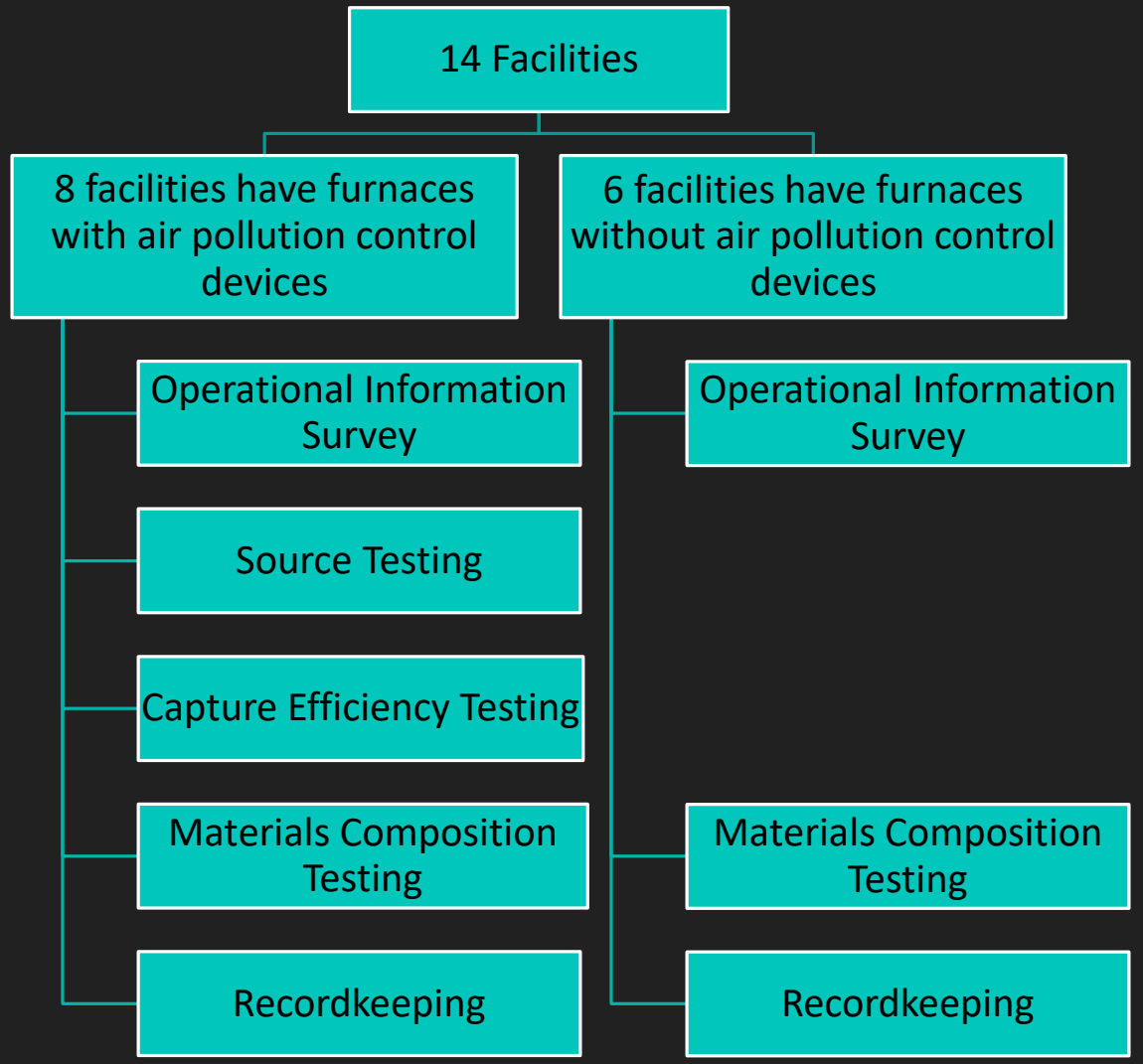
Applicability (subdivision (b))

- *Applies to the owner or operator of any facility conducting chromium alloy melting operation(s), including but not limited to, smelters (primary and secondary), foundries, die-casters, and other miscellaneous melting processes.*

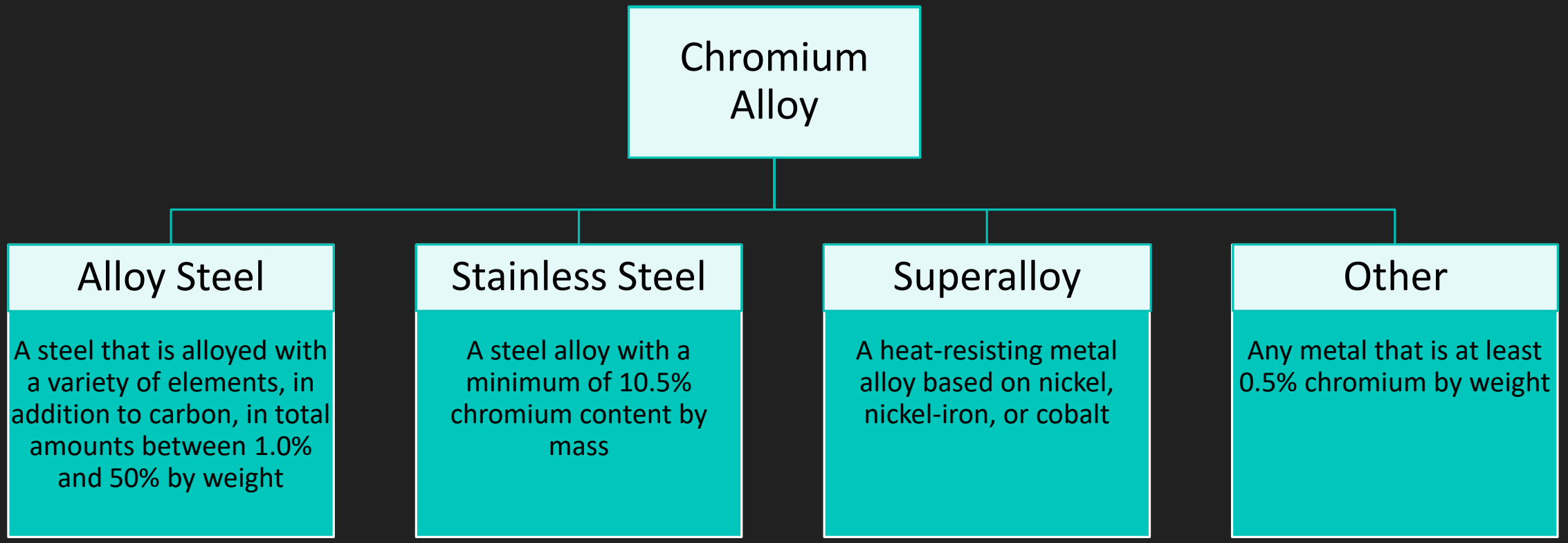


- It is expected that metals with higher chromium concentrations will result in more hexavalent chromium emissions

Potentially Affected Facilities



Key Definitions (subdivision (c))



- Chromium alloy is defined to include any metal with has a chromium content greater or equal to 0.5%, including alloy steel, stainless steel, and superalloys
  - Alloy steel, stainless steel, and superalloys are standard definitions

Operational Information Survey Requirements (subdivision (d))

- Survey form will be provided and pre-populated with information from SCAQMD permits
- Within 60 days of rule adoption, the owner or operator of a facility conducting chromium alloy melting operation(s) shall submit a completed Operational Information Survey that includes:

Casting

Casting techniques or processes performed on chromium alloys

Finishing

Finishing activities or operations performed on chromium alloys

Furnaces

Permitted and unpermitted furnaces melting chromium alloys

Housekeeping

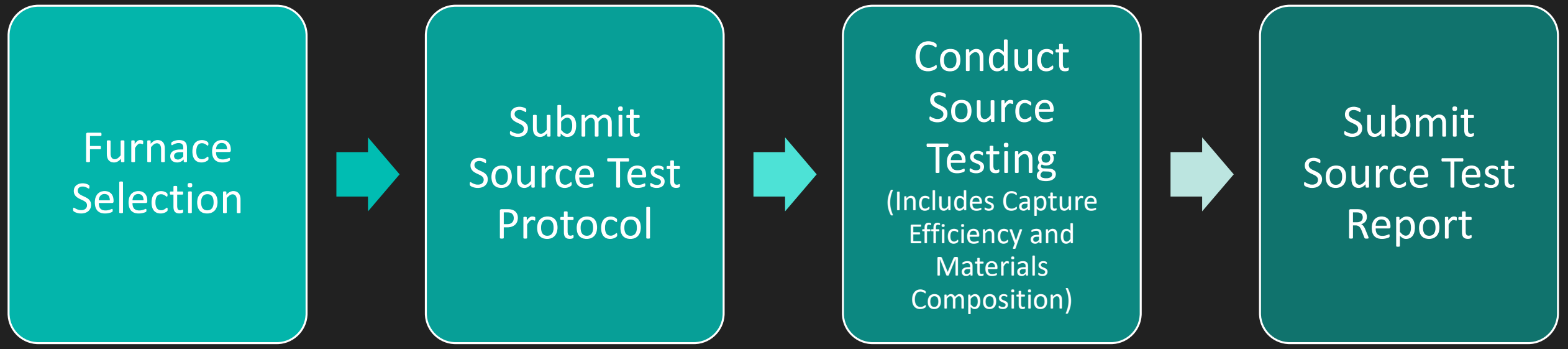
Housekeeping activities routinely performed

Operational Information Survey Requirements (subdivision (d)) *(continued)*

For each metal melting furnace melting chromium alloy:

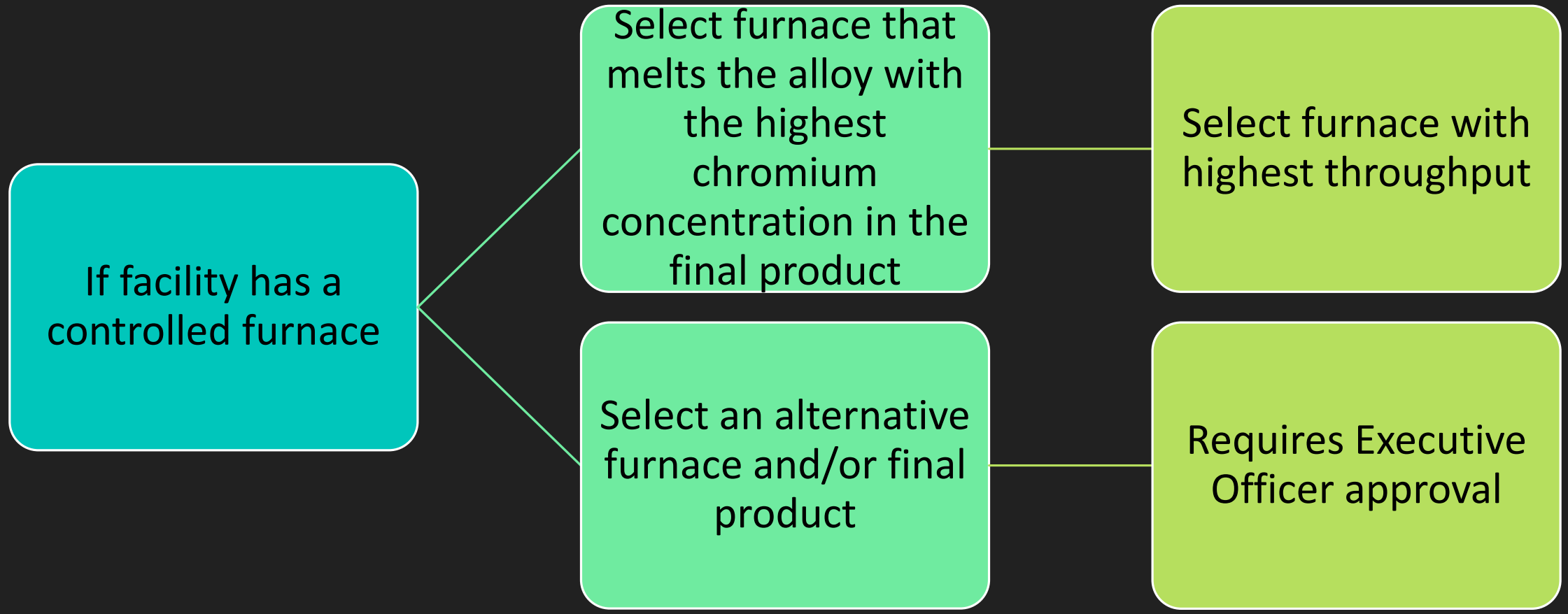
- Furnace information
  - SCAQMD permit number and device identification number, if applicable
  - Make, model, serial number, date of manufacture, and date of installation
  - Furnace type
  - Size and capacity
  - Range of operating temperatures
  - Fuel type, if gas fired, include British Thermal Unit (BTU) gas rating and burner age
- Furnace operating information
  - Weight of metal processed
  - Operating temperatures
  - Metals and alloys melted
- Refractory information
  - Type of refractory brick and refractory coating, including chromium content
  - Frequency of refractory brick replacement and refractory coating application
- Associated Emission Collection Systems and/or Emission Control Devices

Source Test Requirements (subdivision (e))



- Further testing is necessary to assess toxic air contaminant emissions during chromium alloy melting operations
- Source test requirements and Guidelines for the Preparation of Rule 1407.1 Source Test Protocols establish procedures to ensure results are accurate and representative of a source's emissions

Furnace Selection for Source Testing (paragraphs (e)(1) & (e)(2))



- Provision required only for furnaces with a control device because source testing on furnaces without control devices will give only qualitative data, which cannot be used to establish an emission limit
- If a facility does not use a particular furnace or melt a particular product often, provision allows for alternatives to be selected for source testing

Source Test Protocol (paragraphs (e)(3) & (e)(4))

Submit Source Test Protocol within 60 days of rule adoption

- Preliminary Draft Staff Report Appendix 1 – SCAQMD Guidelines for the Preparation of Rule 1407.1 Source Test Protocols
- Specifies which source will be tested and how emissions and samples will be sampled, analyzed, and reported

Approval or rejection of Source Test Protocol

- Based on consistency with Furnace Selection
- Approved protocol establishes procedures to be followed during source testing

Rejected Source Test Protocols

- Revise and resubmit a Source Test Protocol that corrects all identified deficiencies within 30 days
- Revised and resubmitted Source Test Protocol will be:
  - Approved; or
  - Modified and approve it as modified

SCAQMD GUIDELINES FOR THE PREPARATION OF RULE 1407.1 SOURCE TEST PROTOCOLS

Guidelines for Preparing Rule 1407.1 Source Test Protocols

(Included in Preliminary Draft Staff Report – Appendix 1)

Guidance document which lays out the process for developing a Source Test Protocol

Source test protocols establish procedures to ensure results are accurate and representative of a source's emissions

Source Testing (paragraphs (e)(5) & (e)(6))

Within 90 days of approval of the Source Test Protocol, perform source tests for mass emissions and concentration for:

Particulate Matter	Multiple Metals	Hexavalent Chromium
SCAQMD Method 5.1, SCAQMD Method 5.2, or SCAQMD Method 5.3	CARB Method 436	CARB Method 425

- These methods represent the standard methods used by the SCAQMD
- Alternative methods allowed upon approval by Executive Officer

Capture Efficiency Testing (paragraph (e)(7))

At the time the source tests are conducted, perform capture efficiency testing

Quantitative Velocity Measurements

Hot-wire anemometer,
Vane anemometer, or
approved device or method

Qualitative Visual Demonstration

Smoke generators

- Quantitative measurement demonstrates equipment working as designed
- Qualitative visual demonstration indicates that there is no interference with air flow

Materials Composition Testing (paragraph (e)(8))

Perform materials composition testing, from the source test batch

All raw materials (For scrap, test at least three different pieces from each batch of scrap)	Molten material	Final product	Slag	Dross	Baghouse catch (if applicable)

- If the slag, dross, or baghouse catch is not accessible immediately, then test as soon as it becomes accessible
- Materials Composition Testing allows an assessment of the materials added to the furnace and the substances created during the melting process which staff can correlate with the source test results

Alternative Test Methods and Approved Laboratories

Paragraph (e)(9)

- Alternative or equivalent source test methods and materials composition tests may be used, if approved in writing by the Executive Officer

Paragraph (e)(10)

- Source test, capture efficiency testing, and materials composition testing must be performed by laboratory approved under the SCAQMD Laboratory Approval Program
- If there is no approved laboratory, then the testing procedures used by the laboratory may be used, if approved by the Executive Officer in writing

Source Test Notification and Source Test Report

Paragraph (e)(11)

- Notify SCAQMD at least 10 calendar days prior to conducting any test

Paragraph (e)(12)

- Within 60 days of completion of the source tests, submit reports from source tests, capture efficiency, and materials composition testing conducted

SCAQMD Conducted Source Test and Previous Source Test

Paragraph (e)(13)

- Facilities may request for SCAQMD to conduct the source tests
- First three requests will be accepted

Paragraph (e)(14)

- Facilities that have performed source tests, capture efficiency, and materials composition testing within six months prior to rule adoption may use those results if the protocol is SCAQMD-approved and the tests meet the requirements of the rule

Materials Composition Testing (paragraph (f)(1))

Within 180 days of rule adoption, facilities not required to source test shall perform materials composition testing on one batch

Batch must be representative of melting the alloy with the highest chromium concentration in the final product

- All raw materials (For scrap, test at least three different pieces from each batch of scrap)
- Molten material
- Final product
- Slag
- Dross

If the slag, dross, or baghouse catch is not accessible immediately, then test as soon as it becomes accessible

Metals Composition Testing (paragraphs (f)(2) and (f)(3))

- Materials composition testing shall determine the content of arsenic (As), cadmium (Cd), chromium (Cr), hexavalent chromium (Cr6), and nickel (Ni) by weight
- Use the most applicable test method for the sample matrix and as approved by the Executive Officer

U.S. EPA 200.7	U.S. EPA 6010D	U.S. EPA 6020B	U.S. EPA 6200	U.S. EPA 7196A	U.S. EPA 7199
As, Cd, Cr, and Ni	As, Cd, Cr, and Ni	As, Cd, Cr, and Ni	As, Cd, Cr, and Ni	Cr6	Cr6
Water, wastewater, and solid wastes	Aqueous matrices	Water samples and waste extracts or digests	Soil and sediment	Extracts and ground water	Drinking or ground water and industrial wastewater

Recordkeeping Requirements (subdivision (g))

- From 1/1/19 to 1/1/2020, keep records for the following:

Each metal melting furnace

- Monthly records of run hours and weight and type of raw materials processed

Each batch of raw material

- Vendor information

Each baghouse

- Weight of baghouse catch per container and date collected

- Maintain records for three years and submit all records by February 1, 2020
- Records marked “Confidential” will be treated as such under Gov. Code Sec. 6254.7(d)
- This information provides a better understanding of the on-going daily activities and supplements the data received from testing

Exemptions (subdivision (h))

Paragraph (h)(1)

- Equipment and operations subject to the requirements of Rules 1420, 1420.1, and 1420.2

Paragraph (h)(2)

- Facilities that produce less than one ton per year of all chromium alloys

Paragraph (h)(3)

- Furnaces with a capacity less than 25 pounds

Socioeconomic Impact Analysis
and
California Environmental Quality Act

Estimated Costs for Proposed Rule 1407.1

Requirement	Cost	Number of Facilities	Total PR 1407.1 Cost
Source Test	$20,000 – 30,000	8	$160,000 – 240,000
Materials Composition Testing	$300/test $2,700/facility*	14	$37,800
Additional Recordkeeping	$3,000 – 5,000	14	$42,000 – 70,000
Total Costs	**$239,800 – 347,800**		

* Materials Composition Testing
- Assuming 9 materials for materials composition testing
  - 5 raw materials
  - 1 final material
  - 1 slag sample
  - 1 dross sample
  - 1 baghouse catch sample

- No socioeconomic assessment will be conducted as the rule does not significantly affect air quality and emission limitations

California Environmental Quality Act (CEQA)

- PR 1407.1 is considered a project subject to CEQA
- Purpose of PR 1407.1 is for information gathering where no physical modifications will be expected
- SCAQMD has determined that PR 1407.1 is exempt from CEQA, per:
  - CEQA Guidelines Section 15306 – Information Collection, exempts projects undertaken for information gathering purposes
  - CEQA Guidelines Section 15061(b)(3) – Activities Covered by General Rule, exempts project where it can be seen with certainty that there is no possibility that the PR 1407.1 may have a significant adverse effect on the environment
- SCAQMD staff will prepare a Notice of Exemption (NOE) per CEQA Guidelines Section 15062.
- If PR 1407.1 is approved by SCAQMD Governing Board, a NOE will be filed with the county clerks of Los Angeles, Orange, Riverside and San Bernardino counties.

Next Steps

Action	Target Dates
Written Comments Due	September 13, 2018
Stationary Source Committee	September 21, 2018
Set Hearing	October 5, 2018
Public Hearing	November 2, 2018

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