

Program Endorsement Brief:

Manufacturing and Industrial Technology in the North region

North/Far North Center of Excellence, July 2020

OVERVIEW

This report provides an overview of the labor market demand and related educational program supply for occupations related to manufacturing and industrial technology in the 7-county North region, the 22-county North/Far North region, and California.

SUMMARY OF KEY FINDINGS

- Manufacturing and industrial technology occupations are projected to have 236 job openings per year over the next five years.
- Entry-level hourly wages are above the North living wage for a single adult, ranging from \$17.78 to \$35.66 per hour.
- North region postsecondary training providers conferred an average of 6 certificates and 15 associate degrees in manufacturing and industrial technology programs between 2016 and 2019.

The report contains the following sections:

- Occupational demand,
- Wages and job postings,
- Education and training,
- Regional program supply, and
- Findings and recommendations.

INTRODUCTION

The North/Far North Center of Excellence was asked to provide labor market information for a proposed program at a local community college. This report focuses on the following occupations:

- Industrial production managers (11-3051.00)
- Quality control systems managers (11-3051.01)
- Manufacturing engineers (17-2199.04)
- Industrial engineering technicians (17-3026.00)
- Manufacturing engineering technologists (17-3029.06)

Please note that since occupational demand data is not available for occupations at the 8-digit SOC code level, the broader 6-digit SOC code will be used.

A review of related programs revealed the following program(s) and Taxonomy of Programs (TOP) code(s) are appropriate for inclusion in this report:

- Manufacturing and industrial technology (0956.00)

The corresponding Classification of Instructional Programs (CIP) code(s) are:

- Manufacturing engineering technology/technician (15.0613)

OCCUPATIONAL DEMAND

Exhibit 1 summarizes the job trends by SOC codes in the 7-county North region, the 15-county Far North region, and California.¹

Exhibit 1. Employment and projected occupational demand²

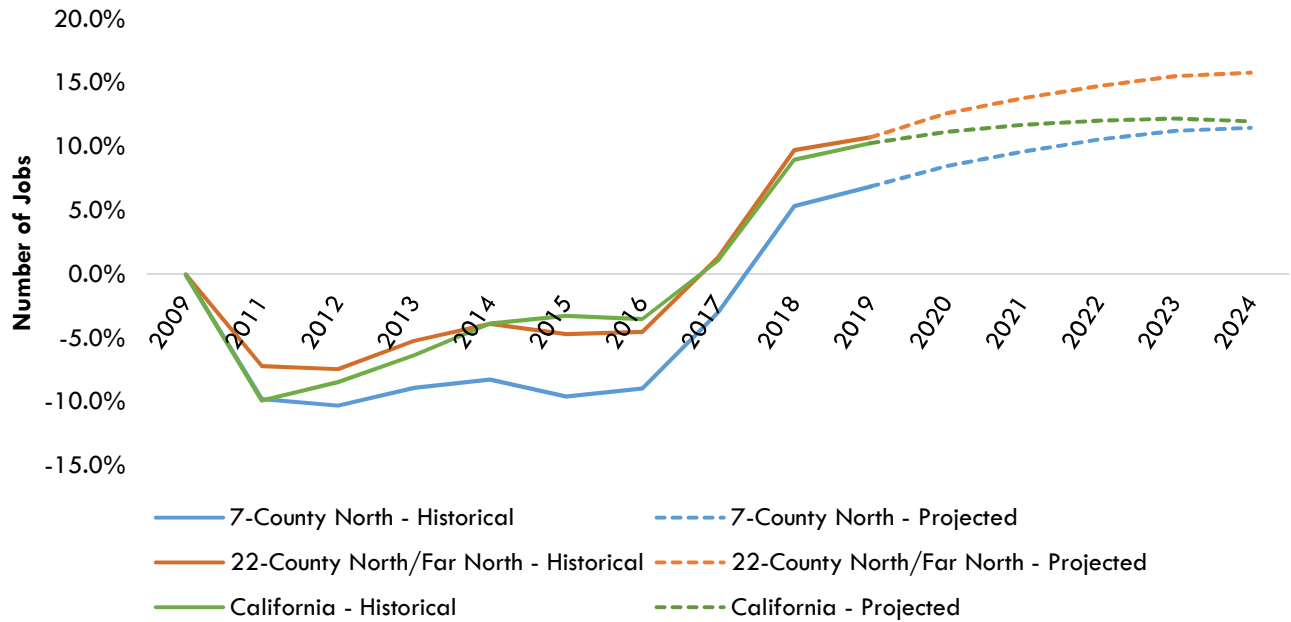
Occupation	SOC	2009 Jobs	2019 Jobs	2024 Jobs	2019-24 % Change	Annual Openings
Industrial Production Managers	11-3051	502	696	752	7.9%	66
Engineers, All Other	17-2199	1,079	945	987	4.5%	83
Industrial Engineering Technicians	17-3026	175	154	162	5.1%	19
Engineering Technicians, Except Drafters, All Other	17-3029	494	584	607	3.9%	68
NORTH	TOTALS	2,250	2,380	2,508	5.4%	236
Industrial Production Managers	11-3051	678	968	1,021	5.5%	93
Engineers, All Other	17-2199	1,292	1,195	1,237	3.5%	104
Industrial Engineering Technicians	17-3026	186	167	178	6.6%	22
Engineering Technicians, Except Drafters, All Other	17-3029	610	734	768	4.6%	87
NORTH/FAR NORTH	TOTALS	2,767	3,064	3,204	4.6%	306
Industrial Production Managers	11-3051	16,160	20,867	20,960	0.4%	1,802
Engineers, All Other	17-2199	25,193	23,798	24,282	2.0%	1,961
Industrial Engineering Technicians	17-3026	4,353	4,484	4,632	3.3%	544
Engineering Technicians, Except Drafters, All Other	17-3029	9,399	11,626	11,844	1.9%	1,275
CALIFORNIA	TOTALS	55,105	60,775	61,717	1.6%	5,582

¹ The 7-county North region includes El Dorado, Placer, Nevada, Sacramento, Sutter, Yolo and Yuba. The 15-county Far North region includes the Butte, Colusa, Del Norte, Glenn, Humboldt, Lake, Lassen, Mendocino, Modoc, Plumas, Shasta, Sierra, Siskiyou, Tehama and Trinity counties. The 22-county North/Far North region is the combination of the 7-county North and 15-county Far North regions.

² Emsi 2020.2; QCEW Employees, Non-QCEW Employees and Self-Employed.

Exhibit 2 compares the rates of change of the total number of jobs between 2009 and 2019 in the North region, the North/Far North, and California. It also compares occupational demand projections from 2019 through 2024 across the same areas. The rate of change is indexed to the base year 2009 total number of jobs.

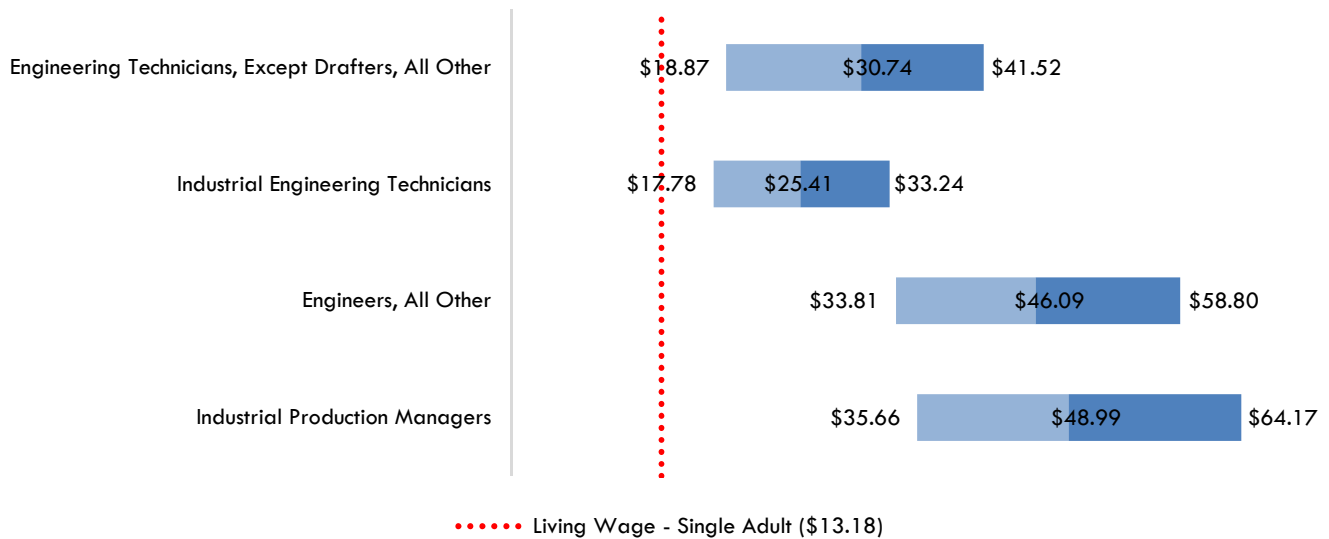
Exhibit 2. Rate of change for selected occupations³



WAGES

Exhibit 3 compares the entry-level, median, and experienced hourly wages of the selected occupations to the North region's 7-county average living wage for a one-adult household.⁴

Exhibit 3. Wages for selected occupations⁵



³ Ibid.

⁴ "Family Needs Calculator (Formerly the Self-Sufficiency Standard)." Insight Center for Community Economic Development, February 2018. <https://insightccd.org/2018-family-needs-calculator/>. Updated 2020 wage data for all counties in the state of California can be found here: <http://www.selfsufficiencystandard.org/California>

⁵ Emsi 2020.2; QCEW Employees, Non-QCEW Employees and Self-Employed.

JOB POSTINGS

Using Burning Glass Labor Insights, the NFN COE can analyze job postings for occupations coded down to the 8-digit SOC level. This section of the report providing real-time analysis of hiring activity in the 7-county North regions, examining job listings posted online within the last year, from July 1, 2019, through June 30, 2020. Burning Glass identified a pool of 442 job postings in the North region for the selected occupations. Exhibit 4 shows a breakdown of job postings by occupation.

Exhibit 4. Job postings by occupation

Occupation	SOC Code	Job Postings	Share of Postings
Industrial Engineering Technicians	17-3026.00	148	33%
Industrial Production Managers	11-3051.00	110	25%
Quality Control Systems Managers	11-3051.01	98	22%
Manufacturing Engineers	17-2199.04	86	19%
Manufacturing Engineering Technologists	17-3029.06	0	0%
North region job postings	Totals	442	100%

According to EMSI, more than 80% of jobs for the selected occupations are concentrated in three industry sectors: government/public administration (32.8%), manufacturing (29.6%); and, professional, scientific, and technical services (20.8%).⁶ Ninety-two percent of all jobs are concentrated in the sectors above, plus administrative and support and waste management and remediation services (3.1%); management of companies and enterprises (2.8%); and wholesale trade (2.6%).⁷ For this report, the NFN COE focused its search of job postings located in the public administration, manufacturing, and professional, scientific, and technical services sectors. Searching Burning Glass this way enabled NFN COE to filter extraneous job postings that had little to do with the subject of this report.

Exhibit 5 shows the number of job postings in the North region, by city, for the selected occupations. All job postings included a location.

Exhibit 5. Top job postings locations for selected occupations⁸

City	Job Postings	Share of Postings
Sacramento, CA	243	55%
Woodland, CA	49	11%
West Sacramento, CA	30	7%
Rancho Cordova, CA	19	4%
Roseville, CA	13	3%
Folsom, CA	13	3%
Yuba City, CA	11	2%
Rocklin, CA	11	2%
El Dorado Hills, CA	10	2%
Davis, CA	9	2%

⁶ Emsi 2020.2; QCEW Employees, Non-QCEW Employees and Self-Employed. "Inverse Staffing Patterns" report. Accessed July 13, 2020.

⁷ Ibid.

⁸ Ibid.

Exhibit 6 lists North region employers with the most job openings for the selected occupations. Seventy-nine percent of job postings included the employer's name.

Exhibit 6. Top employers by number of job postings⁹

Employer	Number of Postings	Share of Postings
Siemens	23	7%
Milgard Manufacturing	23	7%
County of Sacramento	16	5%
InHarvest, Inc.	13	4%
Agilent Technologies, Inc.	10	3%
Metal Sales Manufacturing Corporation	9	3%
Danaher Corporation	9	3%
Deloitte	8	2%
Pacific Companies	7	2%
Taylor Corporation	6	2%

Exhibit 7 shows the top job titles for the selected occupations in the North region. All 442 job postings included a job title.

Exhibit 7. Top job titles by number of job postings¹⁰

Title	Job Postings	Share of Postings
Manufacturing Engineer	79	18%
Maintenance Technician	79	18%
Production Manager	57	13%
Quality Assurance Manager	29	7%
Maintenance Worker	22	5%
Manufacturing Manager	17	4%
Quality Manager	10	2%
Quality Assurance Supervisor	9	2%
Manager, Quality	9	2%
Manager In Training, Quality	8	2%

⁹ Ibid.

¹⁰ Ibid.

Exhibit 8 shows the skills most in-demand for the selected occupations in the North region. Ninety-five percent of job postings included skills information.

Exhibit 8. Top skills by number of job postings ¹¹

Specialized Skills	Job Postings	Share of Postings
Repair	134	32%
Quality Assurance and Control	112	27%
Quality Management	93	22%
Scheduling	78	19%
Manufacturing Processes	76	18%
Manufacturing Engineering	74	18%
Production Management	74	18%
Project Management	72	17%
Budgeting	68	16%
Predictive / Preventative Maintenance	57	14%
Foundational Skills	Job Postings	Share of Postings
Communication Skills	158	38%
Troubleshooting	141	34%
Planning	110	26%
Problem Solving	109	26%
Teamwork / Collaboration	98	23%
Physical Abilities	81	19%
Preventive Maintenance	68	16%
Organizational Skills	66	16%
Detail-Oriented	55	13%
Microsoft Office	55	13%
Software and Programming Skills	Job Postings	Share of Postings
Microsoft Office	55	13%
Microsoft Excel	54	13%
Enterprise Resource Planning (ERP)	35	8%
SolidWorks	34	8%
Microsoft Word	28	7%
AutoCAD	24	6%
Microsoft PowerPoint	20	5%
SAP	20	5%
ISO 9000	15	4%
Word Processing	15	4%

¹¹ Ibid.

EDUCATION AND TRAINING

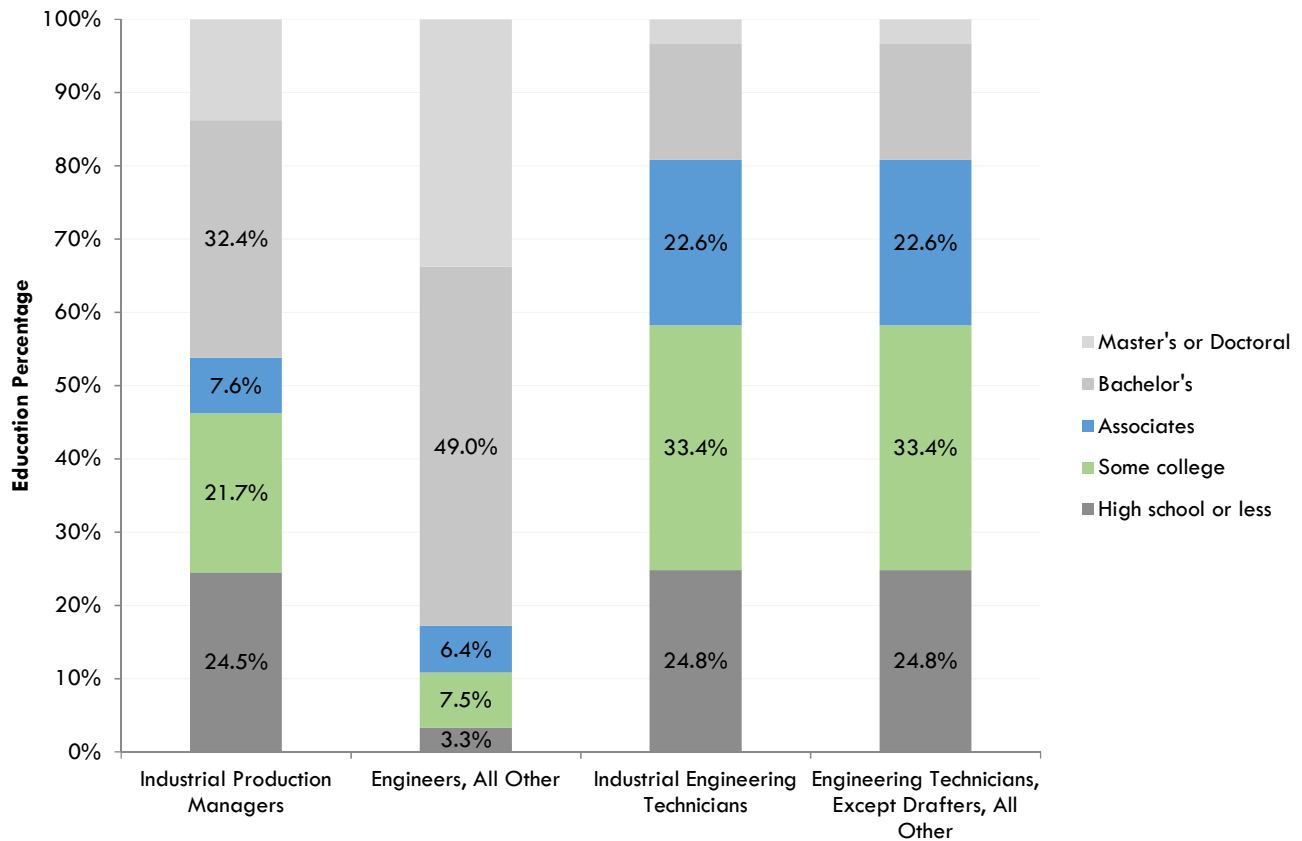
Exhibit 9 shows the typical education requirements, on-the-job training, and work experience requirements for entry-level positions in the selected occupations in the North region.

Exhibit 9. Typical education, training, and work experience for selected occupations¹²

Occupations	SOC	Typical Entry-Level Education	Work Experience Required	Typical On-The-Job Training
Industrial Production Managers	11-3051	Bachelor's degree	Five years or more	None
Engineers, All Other	17-2199	Bachelor's degree	None	None
Industrial Engineering Technicians	17-3026	Associate's degree	None	None
Engineering Technicians, Except Drafters, All Other	17-3029	Associate's degree	None	None

Exhibit 10 shows the average level of educational attainment for workers 25 years and older by occupation across the U.S.

Exhibit 10. Typical educational attainment for selected occupations, nationally¹³



¹² Emsi 2019.4; QCEW Employees, Non-QCEW Employees and Self-Employed.

¹³ "Educational Attainment for Workers 25 Years and Older by Detailed Occupation." U.S. Bureau of Labor Statistics. U.S. Department of Labor, September 4, 2019. <https://www.bls.gov/emp/tables/educational-attainment.htm>.

PROGRAM SUPPLY

Exhibit 11 compares the average number of certificates and degrees conferred by selected programs over the last three academic years.

Exhibit 11. Annual average of awards conferred by program, 2016-2019¹⁴

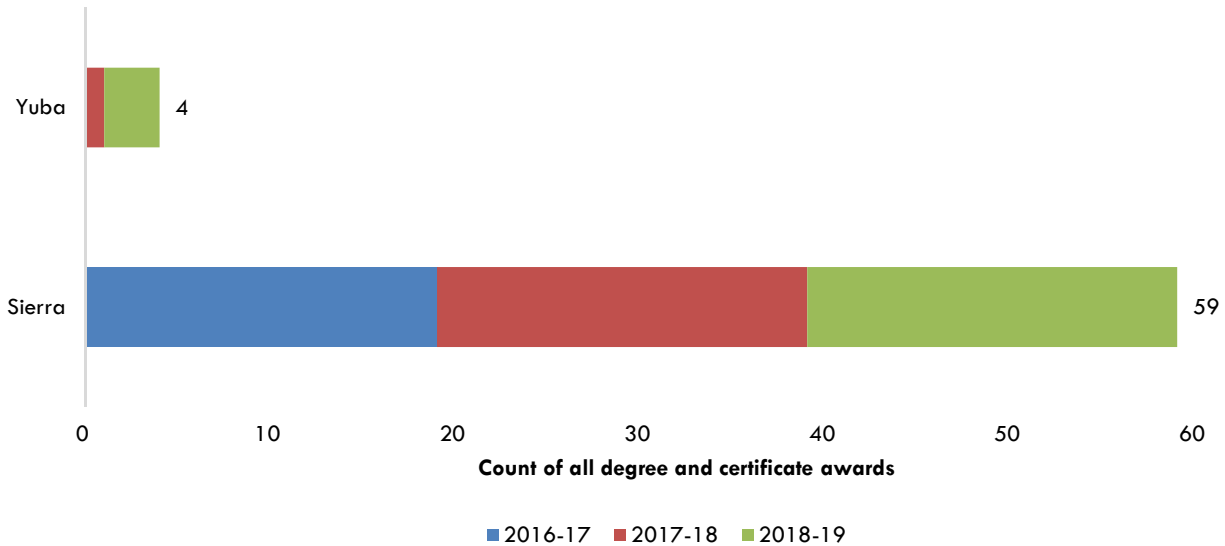


Exhibit 12 compares the average number of certificates and degrees conferred by postsecondary training providers over the last three academic years.

Exhibit 12. Annual average of awards conferred by training providers, 2016-2019¹⁵

	Certificate				Associate			
	2016-17	2017-18	2018-19	3-Yr Avg	2016-17	2017-18	2018-19	3-Yr Avg
Manufacturing and Industrial Technology - 0956.00								
Sierra College	7	6	2	5	12	14	18	15
Yuba College	0	1	2	1	0	0	1	0
Totals	7	7	4	6	12	14	19	15

¹⁴ COE Supply Tables, California Community Colleges Chancellor's Office DataMart, and Integrated Postsecondary Education Data System (IPEDS).

¹⁵ Ibid.

FINDINGS

- Between 2009 and 2019, jobs in manufacturing and industrial technology occupations increased by 5.8% in the North region. These jobs are projected to grow at a similar rate, 5.4%, over the next five years, adding 128 jobs by 2024.
- Manufacturing and industrial technology occupations are projected to have 236 job openings per year over the next five years.
- Entry-level hourly wages are above the North region's living wage for a single adult, ranging from \$17.78 per hour for industrial engineering technicians to \$35.66 for industrial production managers.
- Across the last 12 months, Burning Glass Labor Insights identified a pool of 442 online job postings for the studied occupations in three sectors: public administration; manufacturing; and, professional, scientific, and technical. The largest share of job postings was for industrial engineering technicians (33%), followed by industrial production managers (25%), quality control systems managers (22%), and manufacturing engineers (19%). There were no job postings for the manufacturing engineering technologist occupation.
- Educational requirements and educational attainment vary by occupation. Entry-level jobs for Industrial engineering technicians and engineering technicians typically require an associate's degree, with 56% of incumbent workers having attended some college or earned an associate's degree. On the other hand, engineers are required to have a 4-year degree, with more than 50% of the workers holding a bachelor's degree or above. While industrial production managers are typically required to have a bachelor's degree, 29% of the workers have an educational attainment level that aligns with the community college space.
- North region postsecondary training providers conferred an average of 6 certificates and 15 associate degrees in manufacturing and industrial technology programs between 2016 and 2019. Sierra College confers the bulk of those awards.

RECOMMENDATIONS

- Based on a three-year average of annual awards in related North region manufacturing and industrial technology programs (21 certificates and degrees) and projected yearly openings for related occupations (236 openings), the region appears to have room for new training programs.

COE Recommendation		
Move forward with program	Program is not recommended	Additional information needed
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

METHODOLOGY

Occupations in this report were identified using O*Net. Findings in this report were determined using labor market data from the Bureau of Labor Statistics (BLS), U.S. Census Bureau data from Emsi, and jobs posting data from Burning Glass.

APPENDIX A: DATA SOURCES

Sources used for data analysis purposes in this report include:

- U.S. Department of Labor/Employment and Training Administration (DOLETA) O*NET Online
- Burning Glass, Labor Insight/Jobs
- Economic Modeling Specialists, International (EMSI)
- California Employment Development Department, Labor Market Information Division (EDD, LMID)
- Bureau of Labor Statistics, Occupational Employment Statistics (OES)
- California Community Colleges Chancellor's Office, Cal-PASS Plus LaunchBoard
- Living Insight Center for Community Economic Development, Self-Sufficiency Standard Tool for California
- California Community Colleges Chancellor's Office Management Information Systems (MIS Data Mart)
- U.S. Department of Education, National Center for Education Statistics, Integrated Postsecondary Education Data System (IPEDS)

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