



Meeting No. 2024-02

San Pedro Bay Ports Sustainable Supply Chain Advisory Committee *April Meeting Summary*

- Date:** April 25, 2024 | 9:00 am – 12:00 pm
- Location:** SSA Marine Terminal at Port of Long Beach; IMC Pacific in Compton
- Attachments:** Attachment A – Attendees
Attachment B – Meeting Agenda
Attachment C – Site Host Preview

Meeting Summary

Committee members and port and city staff met at the Harbor Maintenance building on the Port of Long Beach complex and caravanned to visit heavy-duty electric and hydrogen fuel cell equipment at SSA Marine’s Pier J and Pier C facilities and IMC Pacific’s Compton facility. Prior to the meeting, the Committee approved the January 2024 meeting summary by email.

At Pier J, the audience was given a tour of SSA’s RTG crane retrofitted to run on electricity, and informed about SSA’s experience with a battery electric top handler. The RTG crane was one of 9 retrofitted to electric power with the assistance of a California Energy Commission grant secured by the Port of Long Beach. SSA staff advised the group that the RTG, which must be connected to an electric power cable to operate and uses automated steering to run in the trenched pathway, has worked reasonably well; however, the team has concluded that corded electric technologies are not an appropriate solution for their zero emission operations goal due to the restricted maneuverability and extensive 18-month electrical infrastructure work required. SSA expects that the cranes will work for another five to seven years, but added that the electrical system has another 30 years of service. One aspect of the development process was testing automated steering solutions including laser, GPS, and embedded sensors. SSA is investigating hydrogen fuel cell and battery electric solutions for its long-term plan. Meanwhile it is dismantling the battery electric top handlers post-demonstration. Citing issues of range, durability, and issues with the chargers as well as on-board inverters, SSA considers batteries to be an insufficient power source for top handler operations and is expecting two hydrogen fuel cell-powered units by the end of 2025. SSA is not currently applying for grant funding for additional fuel-cell equipment until the demonstrations projects move forward, due to board concerns around the commercial and operational maturity of hydrogen-powered equipment.

At Pier C, the audience was shown SSA’s fleet of battery electric yard trucks and designated charging facility. The project received funding through the California Air Resources Board ZANZEFF grant secured by the Port of Long Beach. The equipment had been developed and first introduced for demonstration in 2019; the vehicles were developed in partnership with Dina and feature 210 kWh batteries. The charging equipment, provided by Tritium, feature a unique probe mounted at a point level with the roof of the vehicle where the charging receptacle is located. SSA staff demonstrated how drivers maneuver the yard trucks into the correct position, where the gearmen can then initiate the charging connection from the charging unit itself. SSA staff and the audience discussed the division of responsibilities between drivers and charging operators (gearmen). SSA commented that while the trucks have met operating requirements when they are fully charged, SSA has faced some challenges



with uptime due to the inability to consistently charge the units. It was noted that not all yard trucks are currently in service as they are working to outfit them with the computer systems needed for container management in the yard. As SSA plans for expanded electrification it is pursuing products from other manufacturers based on lessons learned with charging and vehicle uptime and connection challenges. However, in recent weeks it has had to cut back on its funding applications for additional battery electric yard trucks due to power supply constraints. Its service provider, Southern California Edison (SCE), has recently advised that it will require an upgrade to meet the expected fleet's load and the timeline for energization is between 3 and 7 years.

At the IMC Pacific facility in Compton, IMC provided a brief overview of the company's history and 2028 decarbonization target and answered questions about its experience with and plans for battery electric and hydrogen fuel cell operations in California and elsewhere. IMC has been operating Volvo VNRs and Nikola FCEV TRs in early 2024 and is expecting delivery of several dozen more units in the coming months. While California is its testing ground for zero emission technology it expects to expand to facilities in Illinois and New Jersey next, citing funding incentives and customer demand. IMC pointed to cargo weight as a major determinant of which technology to use: its new trucks cannot carry more than 36,000 lbs. on average, a significant discount relative to the 45,000 lb. industry standard handled by lighter diesel trucks. This is a deal-breaker for many customers, particularly in agriculture. This challenge has been somewhat mitigated by the range of hydrogen fuel cell vehicles, which they can comfortably use to complete their longer return-to-base routes. By comparison, IMC considers their Volvo units to be most appropriate for 20-mile trips locally with frequent returns to base and opportunity charging. IMC added that industry caution with thermal runaway events has contributed to a high recall and battery replacement rate so far, and that each event entails 1-2 weeks of downtime for those vehicles. The frequent downtime associated with these recall events has made it a challenge for IMC to meet some customers' requirements for ZEV-only deliveries. IMC charges its electric Volvo VNRs in its Compton yard. It noted, however, that there is only enough electric service to have five (5) chargers on site. IMC's original plan was to deploy up to 40 battery electric trucks at this site; however, this is not possible given the power service limitations.

Addressing questions about workforce and technical support, IMC commented that its experience adopting both ZEV technologies has improved its understanding of the education necessary for local authorities and emergency responders, and commented that communities in general are still learning about the various benefits and impacts of companies using these technologies. While IMC has historically outsourced its vehicle maintenance, it is considering bringing that in-house at a future date when ZEVs become the majority of their operation due to rising costs for outside service. As for drivers, IMC noted that in general, its drivers under the age of 40 are enthusiastic about both technologies but especially the FCEV technology due to its modern cab design and comfortable drive, while drivers over 40 prefer to stick with the technology they know (diesel).

Regarding fuel costs, IMC reported that it was able to negotiate a very low price of hydrogen fuel (\$7/kg) that allows its FCEVs' overall fuel cost per mile to be less than diesel. IMC fuels at the HYL station in Ontario. Meanwhile, IMC is skeptical that the trucks-as-a-service model are economically competitive and added that it has seen the per-kilowatt-hour prices quoted over the last year rise from about \$0.75/kWh to \$1.00/kWh. IMC is structuring its roll-out of BEVs around its sites with sufficient, affordable electricity. Responding to a question about on-site power generation, staff observed that while microgrids and second-life batteries have some promise, they are concerned that the technologies today that would be appropriate for their needs and facilities are not mature enough to justify the upfront investment. Noting that it expects its vehicle batteries to degrade within the first several years, IMC said it is assessing the cost profile of re-using vehicle batteries for on-site services.

Speaking to questions about market conditions, staff observed that the freight industry is in recession and that companies will likely vacate and consolidate their businesses over the next several years. The regulatory environment is making California particularly challenging for some operators, and IMC opined that the proposed



shift in HVIP eligibility to favor smaller businesses and IOOs was not in-step with the full suite of resources necessary to operate ZEVs in drayage service.



Attachment A
List of Meeting Participants

SSCAC Committee Members	
Joe Lyou	CCA
Regina Hsu	EarthJustice
Kat Janowicz	FuturePorts
Karla Sanchez-Jimenez	Harbor Trucking Association
Sal DiCostanzo	ILWU-13
Michele Grubbs	PMSA
Mei Wang	South Coast AQMD
Giovany Hernandez	Grid Alternatives
Los Angeles Port & City Staff	
Lisa Wunder	Port of Los Angeles
Teresa Pisano	Port of Los Angeles
Arthur Mandel	Port of Los Angeles
Long Beach Port & City Staff	
Heather Tomley	Port of Long Beach
Nina Turner	Port of Long Beach
Zannatul Zannat	Port of Long Beach
Alejandra Guitron	Port of Long Beach
Leela Rao	Port of Long Beach
Meeting Facilitation Staff	
Erik Neandross	TRC
Eleanor Johnstone	TRC
Christopher Davis	TRC
Anna Curtis	TRC
Other Stakeholders	
Scott Hainlen	SSA Marine
Ken Uriu	IMC Pacific
Jim Gillis	IMC Pacific



Attachment B

Meeting Agenda

This meeting will be conducted as an in-person visit to the SSA Marine terminal on the Port of Long Beach property and the IMC Pacific truck depot in Compton, CA. The meeting will follow the below agenda. Personal vehicles may be parked in the visitor lot of the Port of Long Beach Maintenance Division.

Should you need assistance on the day of the meeting please contact one of the organizers:

Erik Neandross: 310-463-5553

Eleanor Johnstone: 310-409-3620

Chris Davis: 310-910-5965

Schedule

9:00 am – Meet at POLB Maintenance Division: 725 Harbor Plaza, Long Beach, 90802

9:05 am – Travel to SSA Marine, 1521 Pier C Street, Long Beach, 90813

9:15 am – Tour SSA Marine (Pier J, option for Pier C as time allows)

10:15 am – Travel to IMC Pacific, 550 West Artesia Boulevard, Compton, 90220

10:45 am – Tour IMC Pacific depot (ride-along as time allows)

11:45 am – Return to Port of Long Beach Maintenance Division

12:15 pm – End of meeting

NB – while we will do our best to return everyone to their cars shortly after 12 noon, we ask that you allow some buffer on your afternoon calendar in the event that traffic is unusually heavy.



Attachment C Site Host Preview

SSA Marine – Emissions Reduction Project Summary

Overview: SSA has been transitioning to low-carbon fuels since 2019, and even switched all of its California-based diesel fuel to renewable diesel in 2021/2022. Since 2019 it has operated diesel-electric hybrid, corded electric, plug-in electric, and hydrogen fuel cell equipment in RTG, Top Pick and Yard Truck operations. It has secured and is applying for more funding to support a full transition to zero emission equipment in these categories. To support the new equipment, SSA is working with the port and several engineering firms on a Zero Emission Infrastructure Master Plan to design infrastructure and parking layouts. Currently, the Long Beach sites do not have enough electrical capacity to support the ports' transition goals and SCE estimates that the upgrades will take 5 to 7 years. SSA is pushing SCE to align their schedule to grant funding deadlines.

Rubber-Tired Gantry (RTG) Cranes

- Diesel-powered equipment burned fuel at the rate of 10 gallons per hour
- Converted RTGs to diesel-electric hybrid at two locations reduced fuel economy to <2 gallons per hour
 - 13 RTGs at OICT (Port of Oakland), 2019 – 2020, in use
 - 6 RTGs at Pier A (Port of Long Beach), 2020 – 2021, in use
- Converted RTGs to corded electric power between 2020 and 2022 reduced emissions significantly but the technology is not considered a long-term solution due to mobility limitations dictated by the power cords and extensive infrastructure work required
 - 9 RTGs at Pier J (Port of Long Beach), 2020 – 2022, in use
- SSA is still evaluating battery electric & hydrogen power for a universal long-term solution

Top Handlers / Top Picks

- Demonstrated first generation battery electric units using AC chargers with initial success including strong performance parity with diesel. However, range was limited to 10-12 hours per day with a >5 hour recharge time, and the chargers and on-board inverters failed constantly
 - 2 top handlers from Taylor, Pier J (Port of Long Beach), 2020 – 2023; no longer in use
- Upcoming: demonstrating liquid hydrogen fuel cell-powered top handlers starting in late 2025/early 2026. Product is in design and port is working with vendors on hydrogen storage and dispensing system.
 - 2 top handlers from Taylor, Pier C (Port of Long Beach), 2025 – TBD
 - 9 additional have received funding from CalSTA/PFIP, Pier C (Port of Long Beach)
 - 8 additional + hydrogen storage/dispensing system have received funding from CalSTA/PFIP, OICT (Port of Oakland)
- Upcoming: replace all top handlers at Pier A and Pier J (Port of Long Beach) through EPA Clean Ports funding application with Port of Long Beach
 - 32 liquid hydrogen fuel cell top handlers + infrastructure, Pier A
 - 50 liquid hydrogen fuel cell top handlers + infrastructure, Pier J
 - 60 liquid hydrogen fuel cell top handlers + infrastructure, OICT

Terminal Tractors / Yard Trucks

- Demonstrating plug-in all-electric terminal tractors began in 2023 and the bugs with an automated charging system are being worked out. The issues to date include: truck mechanical bugs and failures; chargers falling offline; automated communication between chargers and vehicles. SSA is looking at alternatives to the automated connection going forward. Range has been sufficient: SSA allows a one-hour opportunity charge between shifts and the trucks have made it through two back-to-back shifts without issue.
 - 33 electric tractors, Pier C (Port of Long Beach), 2023 – TBD



- Upcoming: replace all terminal tractors at Pier A and Pier J (Port of Long Beach) through EPA Clean Ports funding application with Port of Long Beach
 - 100 trucks + infrastructure, Pier A
 - 164 trucks + infrastructure, Pier J
 - 120 trucks + infrastructure, OICT

IMC Pacific (Compton) – Emissions Reduction Project Summary

Overview: IMC Pacific is the largest marine drayage provider in the country and has 5 facilities serving the ports of Long Beach, Los Angeles and Oakland. Working towards its goal of carbon-free drayage operations by 2028, IMC began operating battery electric and hydrogen fuel cell Class 8 trucks at its Compton, CA facility this year. It has also been operating electric forklifts and yard trucks (Orange EV). As a long-time Volvo customer, IMC partnered with dealer TEC Equipment for technician training and uses a variety of public and private charging and fueling solutions for its over-the-road trucks. The development of commercial-scale public access fueling and charging facilities are part of its long-term fleet transition plan.

Class 8 Tractors

- 6 Volvo VNRes
 - Charging on 5 [FreeWire](#) stations on-site
- 10 Nikola FCEV Tres
 - Fueling at an Ontario station
 - 500-mile range (expected)
- Upcoming: 40 Nikola FCEV Tres (Compton); new 8-acre facility with 30 charging stations (Fontana)
 - Fueling at upcoming HYLEA station (Compton)