VOLTSAFEMARINE

WASHINGTON PORTS

# ELECTRIC OPPORTUNITIES: MARINA SHORE POWER'S FUTURE

**TREVOR BURGESS**
CEO & CO-FOUNDER,
VOLTSAFE

# WHAT WE'LL COVER

1. The Mission Pillars of Public Ports (Marinas)
2. A Brief History of Marina Shore Power
3. Problems Associated with Traditional Plugs
4. NEC 2023 & 2026 Code Changes & Impact
5. Smart Marina Infrastructure
6. Electrification, Microgrids & Peak Demand
7. Transparency, Billing & Boater Trust
8. Grants, Subsidies & Incentives
9. Market Landscape & Modernization Trends
10. Innovation Case Study: VoltSafe
11. Final Takeaways & Q&A

# 1 THE MISSION PILLARS OF PUBLIC PORTS

- Economic Development
- Asset Stewardship & Public Infrastructure
- Environmental Responsibility
- Public Access & Community Benefit
- Compliance & Safety

# 555.1 Scope

Public

Private

# 2 A BRIEF HISTORY OF MARINA SHORE POWER

**1920s - 1930s**
First electrified marinas

**1950s - 1960s**
Twist-lock connectors become standard

**1984**
NEC adds Article 555

**1990s**
Surge in dockside power demand

**2000s**
Safety incidents drive scrutiny

**2010s**
Smart addons emerge

**2020s**
Regulation tightens, innovation lags

**2026**
VoltSafe launches prongless, intelligent shore power

# 555.33 Receptacles

30A, 125V

- Twist-lock
- Requires 30mA ground-fault protection

20A, 125V GFCI

- Not for powering boats
- Labeled: "Not For Shore Power"
- Must be internally ground-fault protected

50A, 125/250V

- Twist-lock
- Requires 30mA ground-fault protection

# 555.33 Receptacles

- Each receptacle requires a circuit breaker
  - Same amperage
  - Same voltage

- Photo:
  - Receptacle - Breaker
  - 50A 125/250V – 50A, 2-Pole
  - 30A 125V – 30A, 1-Pole
  - 20A 125V GFCI – 20A, 1-Pole

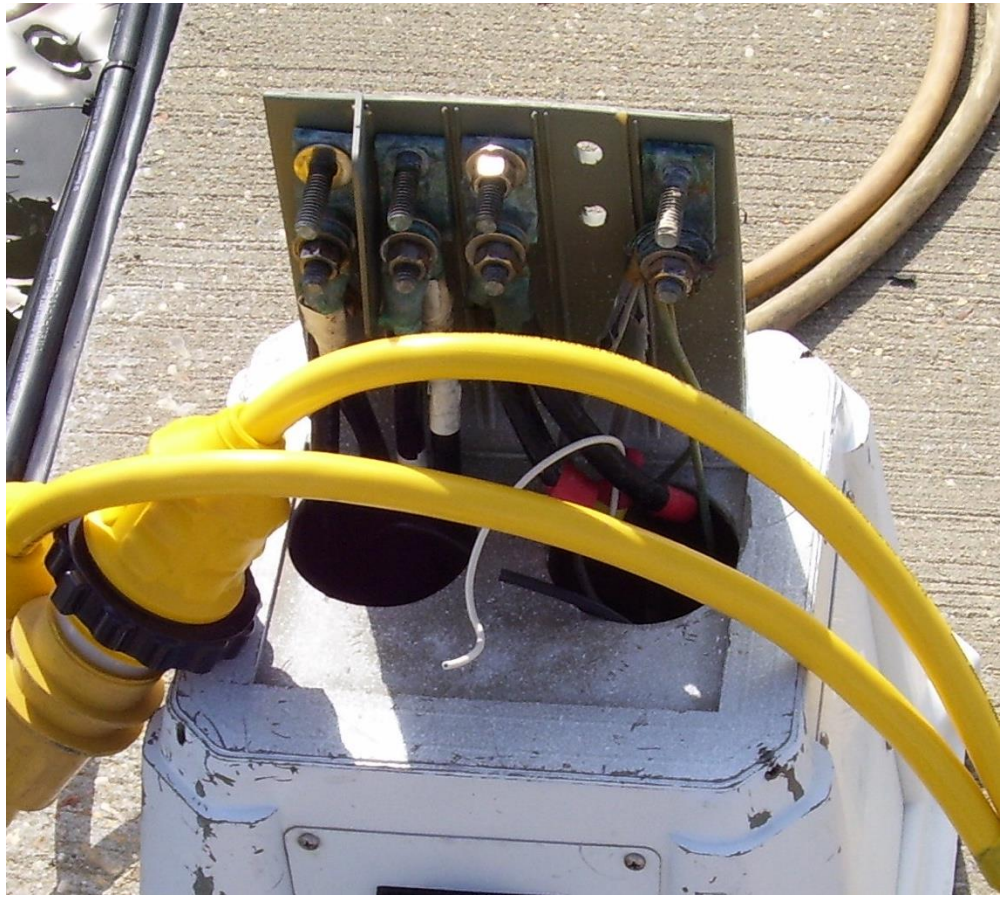
# Receptacle Selection

| Boat Size | Minimum Requirement | Preferred |
|---|---|---|
| 25' and Under | (1) 20A GFCI | (1) 30A and (1) 20A GFCI |
| 25' to 35' | (1) 30A | (2) 30A |
| 36' – 42' | (2) 30A | (1) 50A |
| 43' – 50' | (1) 50A | (2) 50A |
| 51' – 65' | (2) 50A | (2) 50A |
| 66' – 70' | (2) 50A | (2) 50A and (1) 100A 125/250V |
| 71' – 80' | (2) 50A and (1) 100A 125/250V | (2) 100A 125/250V |
| 81' – 95' | (2) 100A 125/250V | (2) 100A 125/250V and (2) 100A 120/208V |
| 96' – 115' | (2) 100A 120/208V | (2) 100A 120/208V and (2) 100A 480V |
| 116' – 150' | (2) 100A 120/208V and (2) 100A 480V | (2) 100A 480V and (1) 200A 480V* |
| 151' – 200' | (2) 100A 480V and (1) 200A 480V* | (2) 200A 480V* |
| 201' + | (2) 200A 480V* | (2) 200A 480V* |

*** Cam-Lock Connectors Highly Recommended**

# Homemade Cord Sets and Adapters


# Damage



# NFPA 303 5.20

# Missing Doors

# NFPA 303 5.20

# Contact Information: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Vice President – Sales / Design
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***E-mail for CEUs***

# General Note – *Listed Products*

- Listed products go through stringent tests to ensure products meet certain safety guidelines.

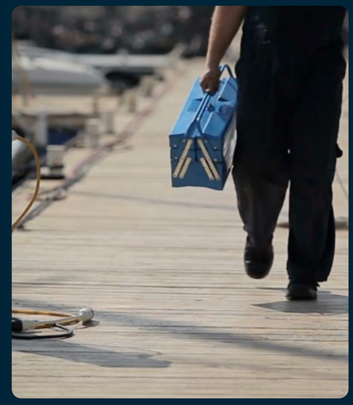
# General Note – *Adapters and Splitters*

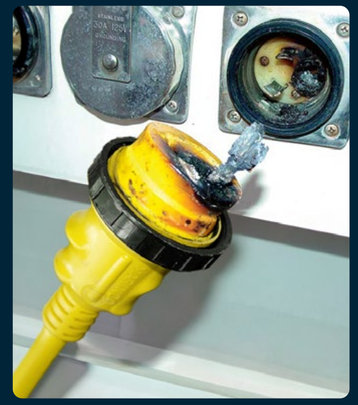
- Most "Y-Adapter" cord sets are not listed products and do not provide the proper circuit protection for a safe electrical connection.

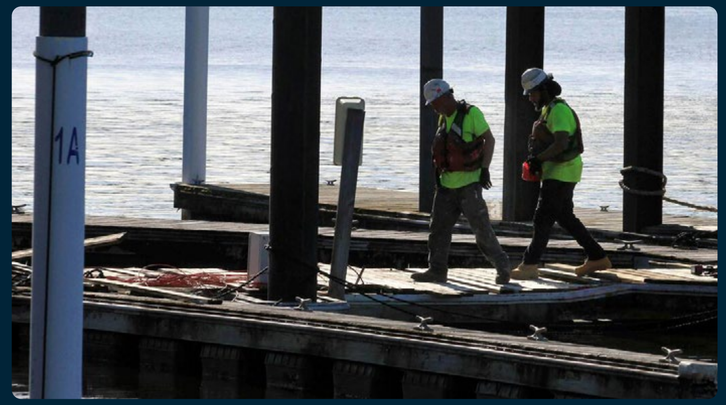
- Listed products go through stringent tests to ensure products meet certain safety guidelines.

# 3 THE ‘CURRENT’ PROBLEM

- Hidden risks
- Rising costs
- Liability exposure
- Customer expectations

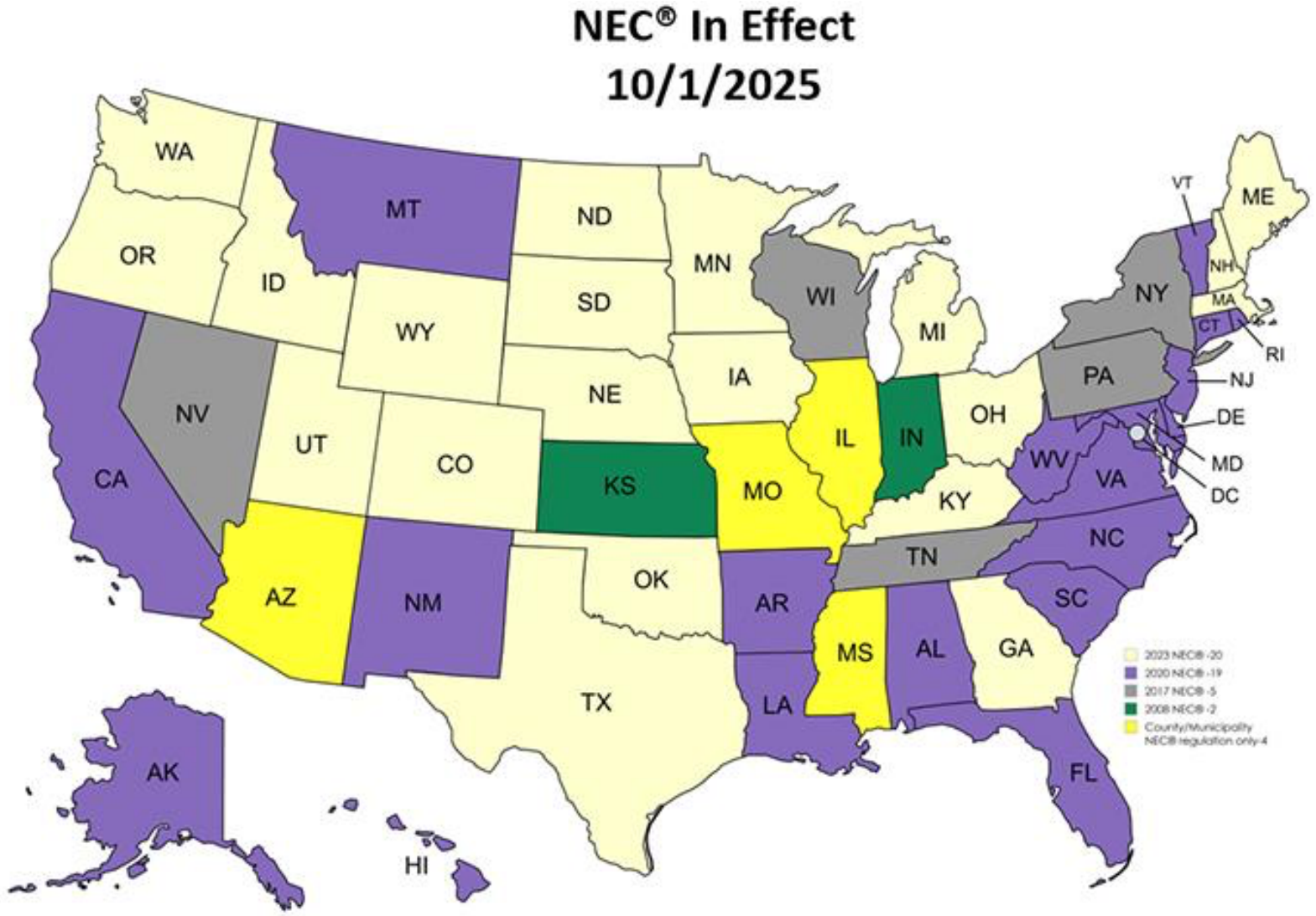




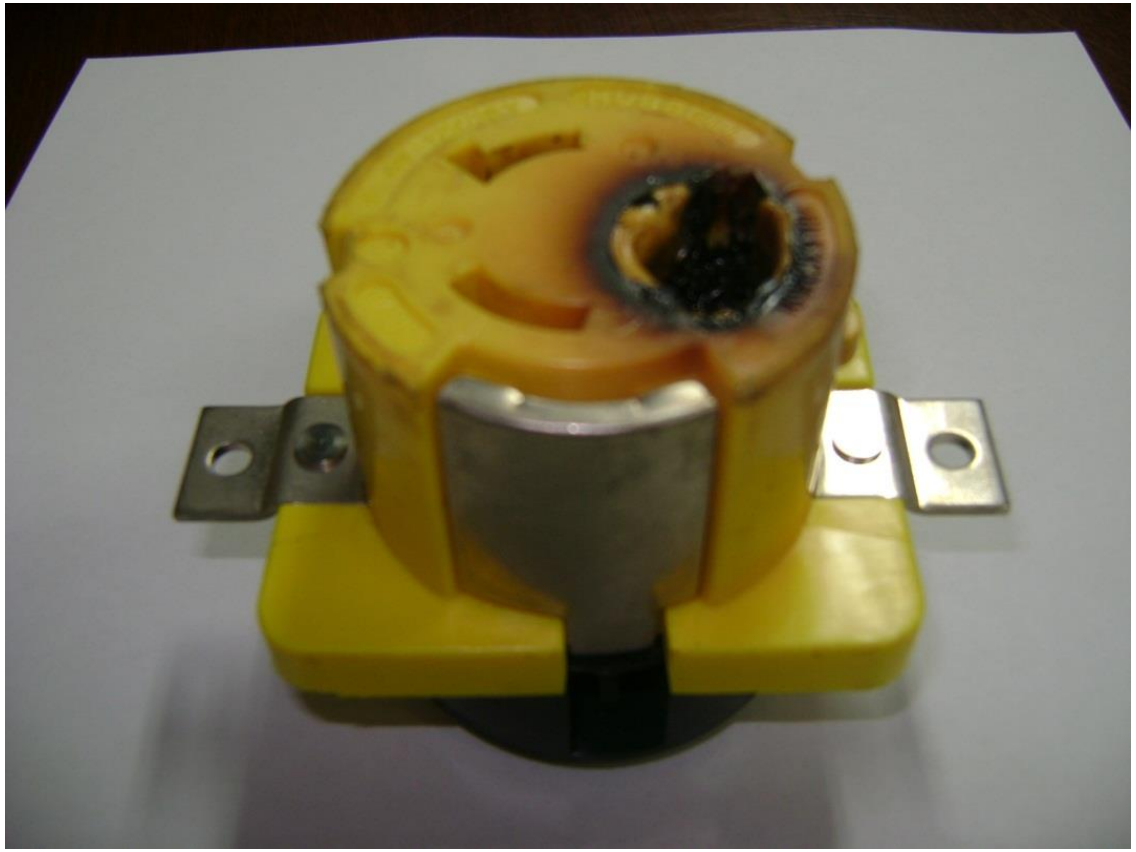



# General Note: Code Adoption

- States adopt version of the National Electrical Code at different times.
- Map Courtesy of NFPA.org



# NFPA 303 5.20



# Why Is Testing Required?

- Identify boats with potentially dangerous electrical leakage problems before they connect to your marina electrical system.
- Typically ground-fault monitor tied to various receptacles and circuit breakers designed to evaluate the integrity of a boat's electrical system.
- Visual displays help provide added piece of mind that a boat connecting to your marina is electrically safe.

# 555.33 Receptacles


- At least 12” high

- Not below electrical datum plane

# 555.35 Ground-Fault Protection of Equipment (GFPE) and Ground-Fault Circuit Interrupter

- ***<u>Receptacles in pedestals</u>*** must be protected at 30mA or less
- 30A and above used for shore-power = 30mA or less
- Anything not for shore power = 5mA or less

# 555.35 Ground-Fault Protection of Equipment (GFPE) and Ground-Fault Circuit Interrupter

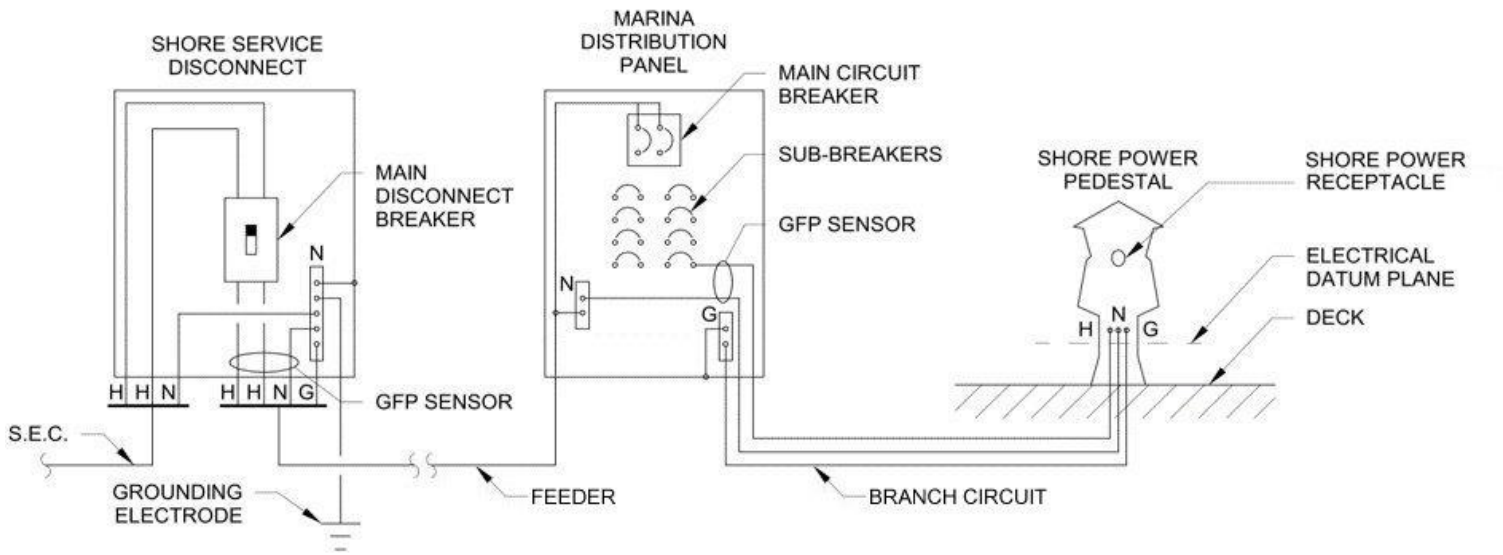



Diagram Courtesy of Gary Loftis

- ***Feeders*** must be protected at 100mA or less
- Feeder – cable or wire powering distribution equipment.
- Examples include cables going to
  - a Transformer
  - a Disconnect
  - a Panelboard

# 555.35 Ground-Fault Protection of Equipment (GFPE) and Ground-Fault Circuit Interrupter

555.35 Ground-Fault Protection of Equipment (GFPE) and Ground-Fault Circuit Interrupter

- ***<u>Will become effective January 1, 2026.</u>***
- No grandfather clauses.
- No adoption delays.

# NFPA 303 4.8: Ground-Fault Testing for Marinas

- All vessels shall be tested for the presence of ac ground faults at the time of the initial connection to the marina electrical system…
- Required annually
- Vessel must display leakage under 30mA
- Retroactive within 2-years of adoption
- Needs to be documented
- Why?
- How and Where?

# 555.35 Ground-Fault Protection of Equipment (GFPE) and Ground-Fault Circuit Interrupter

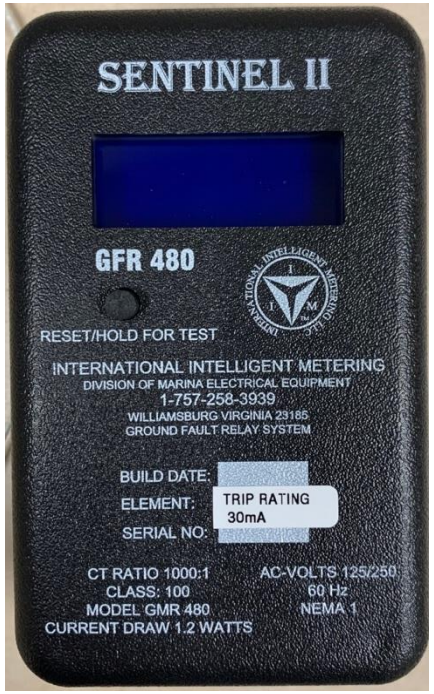
- ***<u>Facilities with more than three (3) receptacles for boats</u>*** must have a leakage testing device for boats.

- Each boat must be tested prior to plugging into the marina.

# 555.36 Disconnecting Means for Shore Power Connection(s)

- Each marina power outlet shall have an emergency shutoff device that must:
  - be within sight of the power outlet.
  - be externally operable.
  - be manually resettable.
  - deenergize all power to the power outlet.

# How and Where to Test?





**<u>Monitors:</u>**

- **<u>Types:</u>**
  - Single-Channel
  - Multi-Channel
  - Integral CT
  - Digital Displays

- **<u>Locations:</u>**
  - Portable
  - Permanent
    - Fuel Piers
    - Greeting Docks

# Cord Set Testers

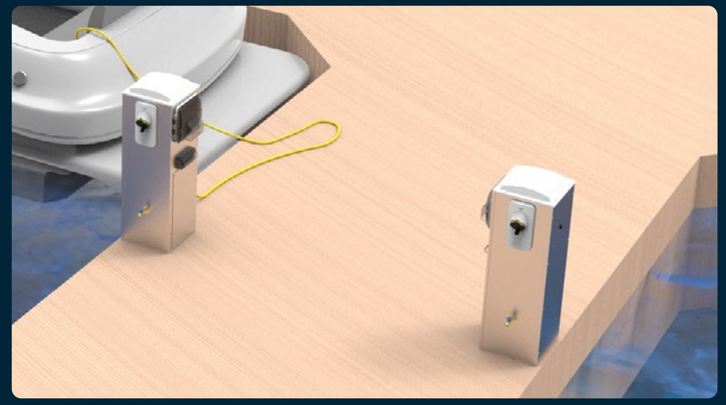
# 555.15 Replacement of Equipment

- Maintenance
  - Light Bulb
  - Receptacle / Breaker
  - Meter

- Modification
  - New dock
  - New panel
  - New cable

# 4 NEC 2026 CHANGES — ARTICLE 555

- Mandatory 30mA GFCI for all marina receptacles >20A
- Disconnects required within line-of-sight
- Equipment must be installed 12″ above high-water datum
- No grandfathering of old gear
- Mandatory leakage current testing before plug-in

# 5 SMART MARINA INFRASTRUCTURE

- Real-time power usage per slip
- Predictive maintenance analytics
- App-based user access & notifications
- Integrated billing + alerts
- No bolt-ons: fully embedded tech

CENTRALIZED DASHBOARD FOR OPERATORS


BOATER'S APP

VOLTSAFE PEDESTALS

VOLTSAFE® unplug. connect.

# REINVENTING THE WAY PEOPLE CONNECT TO AND CONTROL ELECTRICITY

# THE WORLD'S FIRST HIGH POWER PRONGLESS SMART PLUG.

VoltSafe has created an outlet and prongless, magnetic connector controlled by an energy management dashboard or app delivering a safe, simple and smart solution that **saves time, money, energy and lives.**

## VOLTSAFE TECH IS:

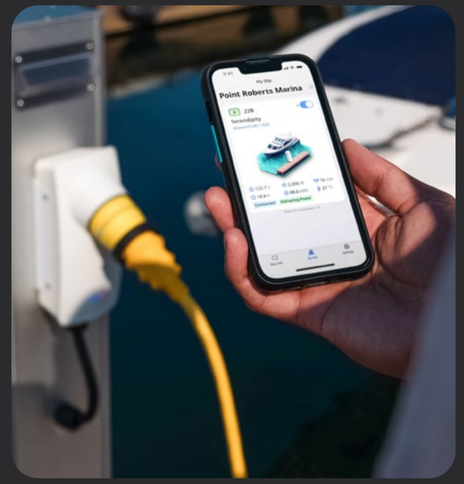
### SAFE

Our technology uses exposed, touch-safe conductive contacts that only activate when connected, thanks to magnets and unique electrical fingerprints. This prevents arcing and allows for easy cleaning to avoid corrosion and fire risk.

### SIMPLE

Our prong-free, magnetic connectors enables easy connection and breakaway disconnection, increasing accessibility for everyone. Our tech is adaptable to any application requiring conductive high power electricity.

### SMART




ALL VoltSafe solutions include proprietary and robust energy management capabilities.

# IT'S A THREE-PRONGED PROBLEM.

Traditional pronged plugs and outlets are outdated and problematic, despite decades of safety tweaks like ground fault adapters and tamper-resistant covers. These additions often create more frustration than function. A century-old design still limits how we power the modern world.

**At VoltSafe, we are innovating on how we connect to and manage electricity - without prongs - so we can finally be rid of antiquated, unsafe and inefficient ways of connecting to power...**

## PRONGED PLUGS ARE:

### UNSAFE

Recessed and always-live traditional outlets pose serious safety risks, including corrosion, arcing, fires, and electrocution.

### UNFRIENDLY

Pronged plugs are hard to use for those with mobility challenges, pose tripping hazards, and can cause serious infrastructure damage.

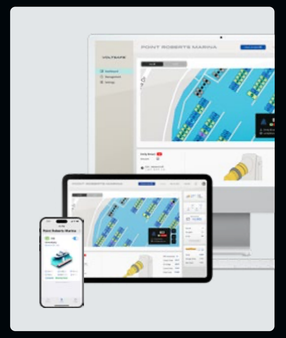
### UNINTELLIGENT


Pronged metal plugs don't allow for fully integrated smart features such as granular energy management, or efficient automation.

# 10 INNOVATION SNAPSHOT — VOLTSAFE

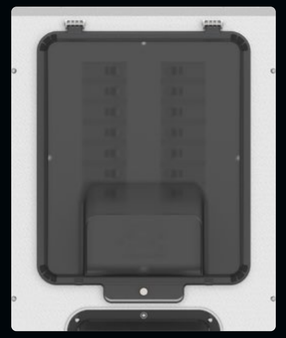
- First certified prongless smart shore power
- No arcing, no corrosion, no exposed live metal
- Smart pedestal + dashboard + app = one ecosystem
- NEC 2026 ready + embedded load sensing

L5-30 ADAPTER



SOFTWARE SUITE

WATER SPIGOTS



BREAKER PANEL

SMART LEDs

X2

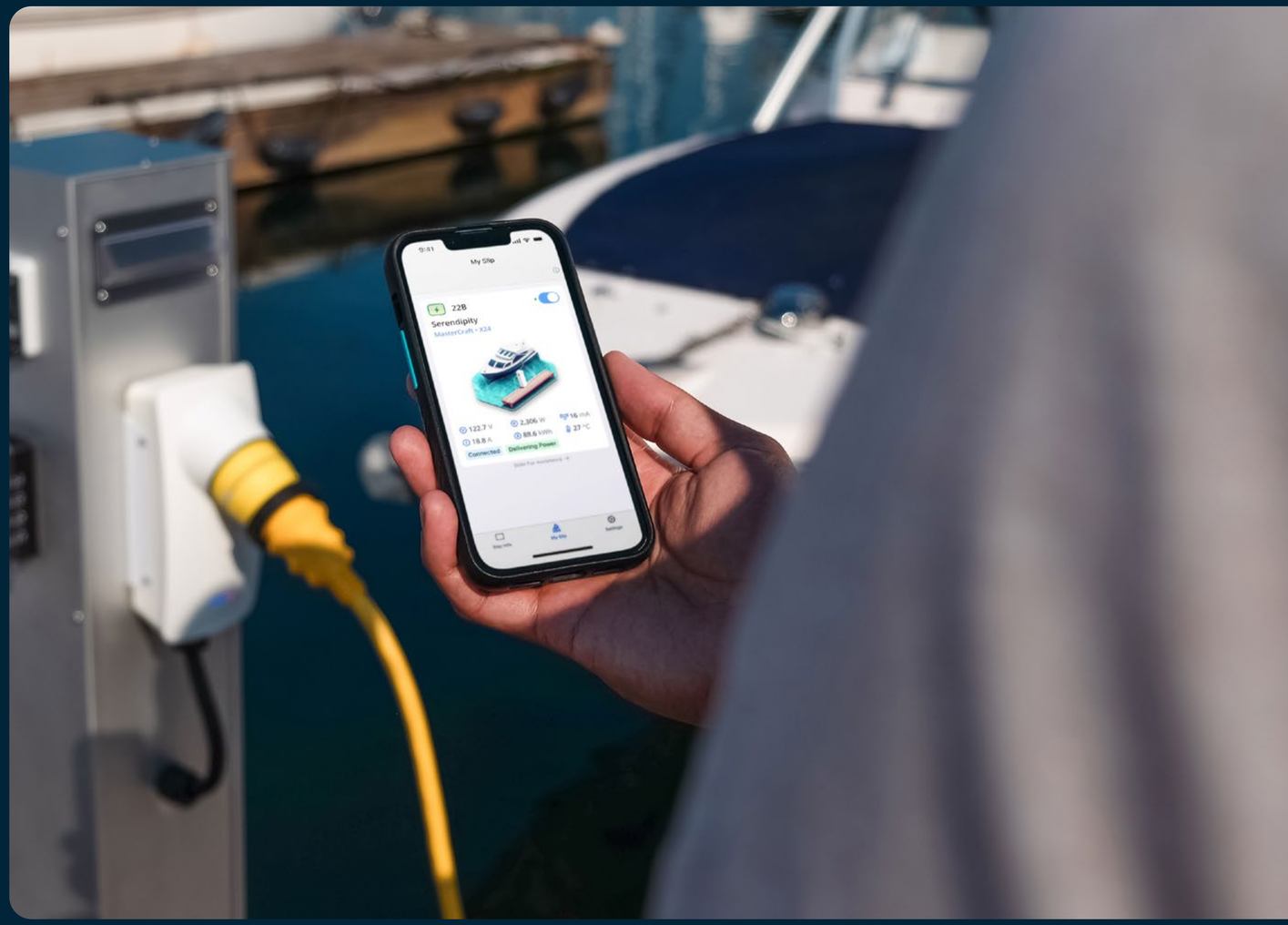
X4

# 9 MODERNIZATION TRENDS & STATS

- 65% of boaters prefer marinas with smart tech
- Smart shore power = 42% fewer outages
- Automated billing = 80% fewer disputes
- +18% avg revenue lift from smart energy tools

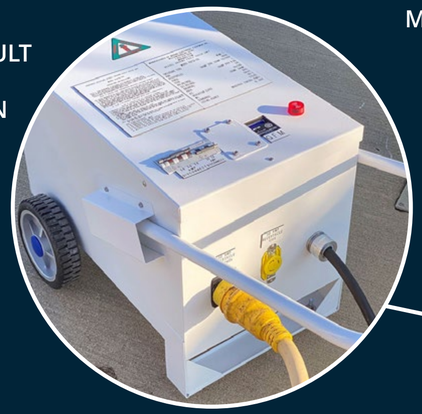
# 7 TRANSPARENCY & BOATER TRUST

- Show power usage in boater app
- Automated, itemized billing
- Instant alerts for unsafe loads
- Visibility builds trust & loyalty



# 5 MAKE ONE DECISION, NOT EIGHT

GROUND FAULT LEAKAGE DETECTION



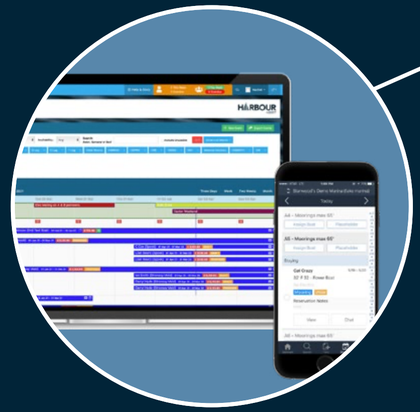
LEAKAGE MEASUREMENT

AUTOMATED PAYMENT

IOT METERING MODULES


LOAD MANAGEMENT


MANAGEMENT SOFTWARE




REMOTE ON/OFF

## HARDWARE

| CONTROL BOX AND PEDESTAL | VOLTSAFE SOLUTION | LIGHTHOUSE (SS) INCUMBENT CORD | HARBOR LIGHT (SS) INCUMBENT CORD |
|---|---|---|---|
| No Arcing | ✓ | X | X |
| No Corrosion | ✓ | X | X |
| IP67 - Sealed to Safety | ✓ | X | X |
| Marina Grade Aluminum | ✓ | X | X |
| Does not Electrify the Water | ✓ | X | X |
| Does not Trip Breakers | ✓ | X | X |
| Prevents Stray Current | ✓ | X | X |
| Accessibility - Easy to Connect/Disconnect | ✓ | X | X |
| Surge Protection | ✓ | X | X |
| Revenue-Grade Power Metering | ✓ | X | X |
| LED Power Indicator Light | ✓ | ✓ | ✓ |
| Automated Safety | ✓ | X | X |
| Remotely Turn Power On and Off | ✓ | X | X |

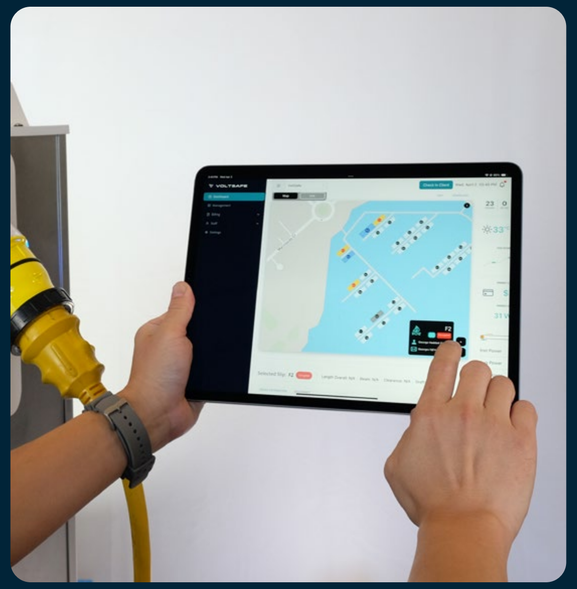
## SOFTWARE

| DASHBOARD AND COMPANION APP | VOLTSAFE SOLUTION | DOCKWA | MARINE SYNC |
|---|---|---|---|
| Marina Manager Dashboard | ✓ | ✓ | ✓ |
| Boat Owner Companion App | ✓ | ✓ | ✓ |
| Boat Owner Shore Power Control | ✓ | X | X |
| Interactive, Real-Time Slip Map | ✓ | X | X |
| Current Leakage Detection | ✓ | X | ✓ |
| Built-In CRM | ✓ | ✓ | ✓ |
| Automated Billing | ✓ | ✓ | X |
| Temperature Monitoring | ✓ | X | X |
| Automated Check In/Out | ✓ | X | X |
| Real-time Power Usage Data/Analytics | ✓ | X | ✓ |
| Real-time Device notifications | ✓ | X | ✓ |
| Peak Demand Monitoring | ✓ | X | X |
| Peak Demand Reduction | ✓ | X | X |
| Marina Shore Power Control | ✓ | X | ✓ |

# 10 WHAT GOOD LOOKS LIKE

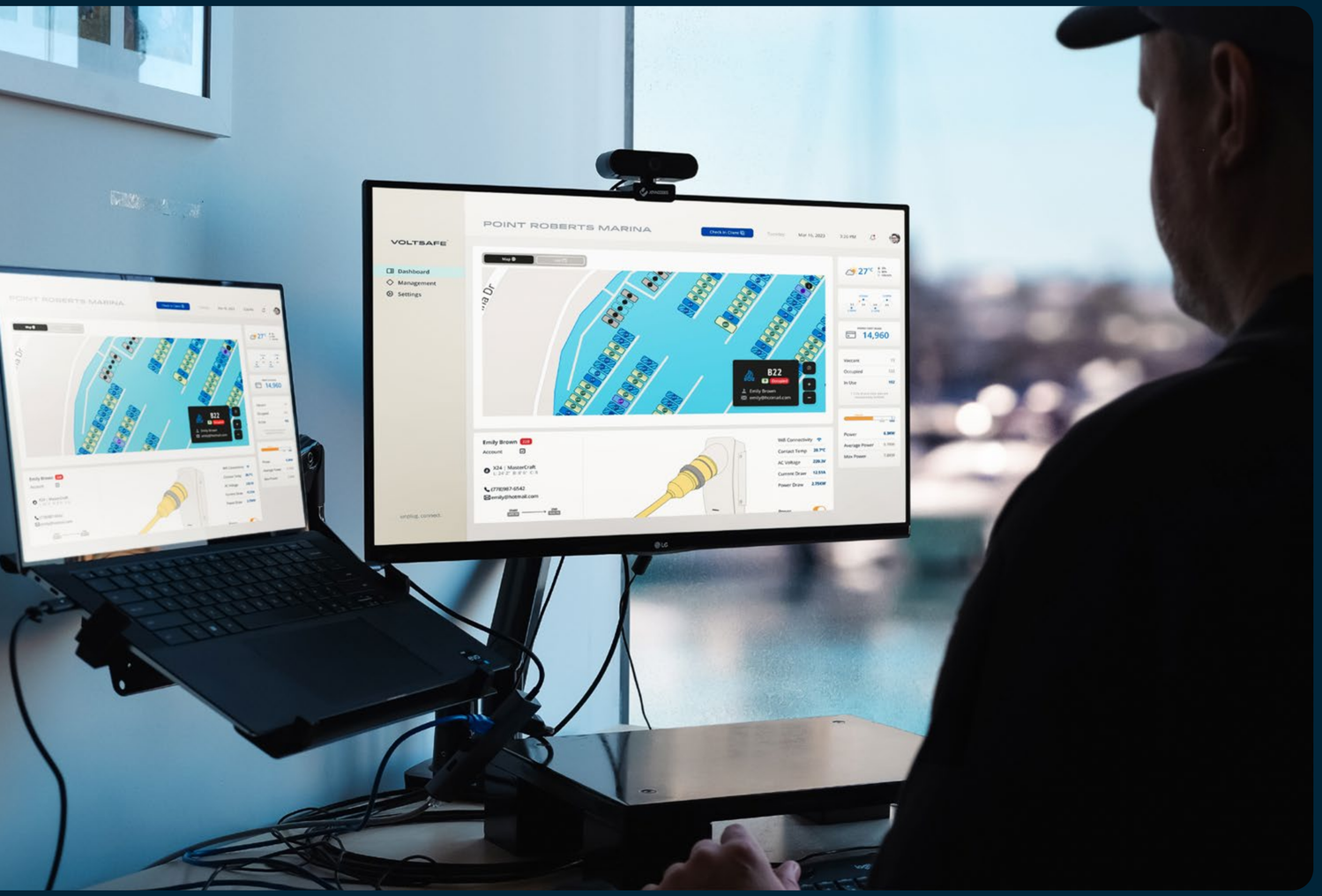
> Magnetic, prongless shore power system.

> Off by default = no risk of shocks.



> Smart dashboard + boater app = real-time visibility, automated billing, alerts.

> Seamless fit with existing marina cord sets.




# 6 PEAK DEMAND MANAGEMENT

- AC, EV chargers, cooktops = massive draw
- Load balancing spreads demand efficiently
- Avoid surprise charges & downtime

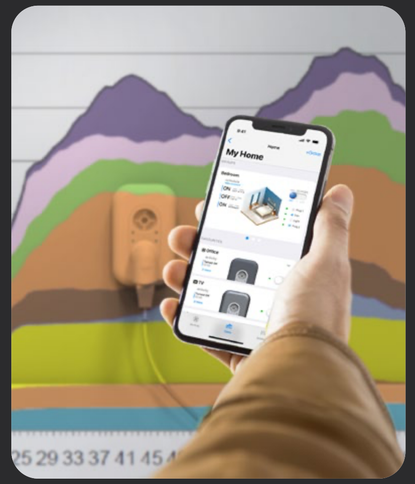
# THE IMPACT

VoltSafe has reimagined how we connect to electricity. Our patented magnetic plug technology is **safe, simple, and smart.** This isn't just an upgrade to how we use power - it's the future of how we connect to and control electricity. VoltSafe is the only company in the world to successfully **achieve safety certification** and **procure patents** on prongless plug contacts for conductive power.

## SAVES LIVES

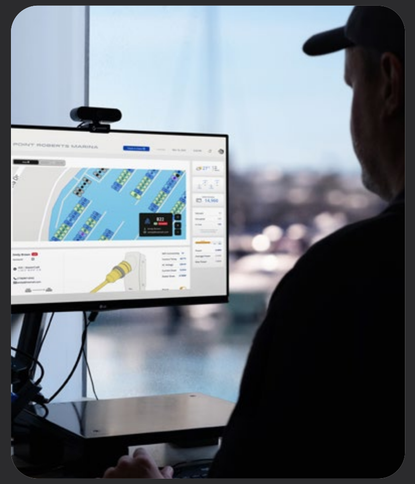
- No live electricity until connected
- Certified to aerospace-level safety
- No fires, no electrocution, no hidden corrosion

## SAVES ENERGY




- Built-in energy monitoring
- Remote control + automation
- Outlet-level data drives efficiency

## SAVES MONEY



- Cuts utility bills and peak demand charges
- Reduces infrastructure or asset damage and downtime
- Minimizes insurance claims infrastructure damage

## SAVES TIME

- Reduces manual labour
- Remotely manage power at the outlet
- Get push notifications before challenges arise
- Monitor energy usage in real time
- Effortlessly manage fleets or customer info

# 6 ELECTRIFICATION & MICROGRID POTENTIAL

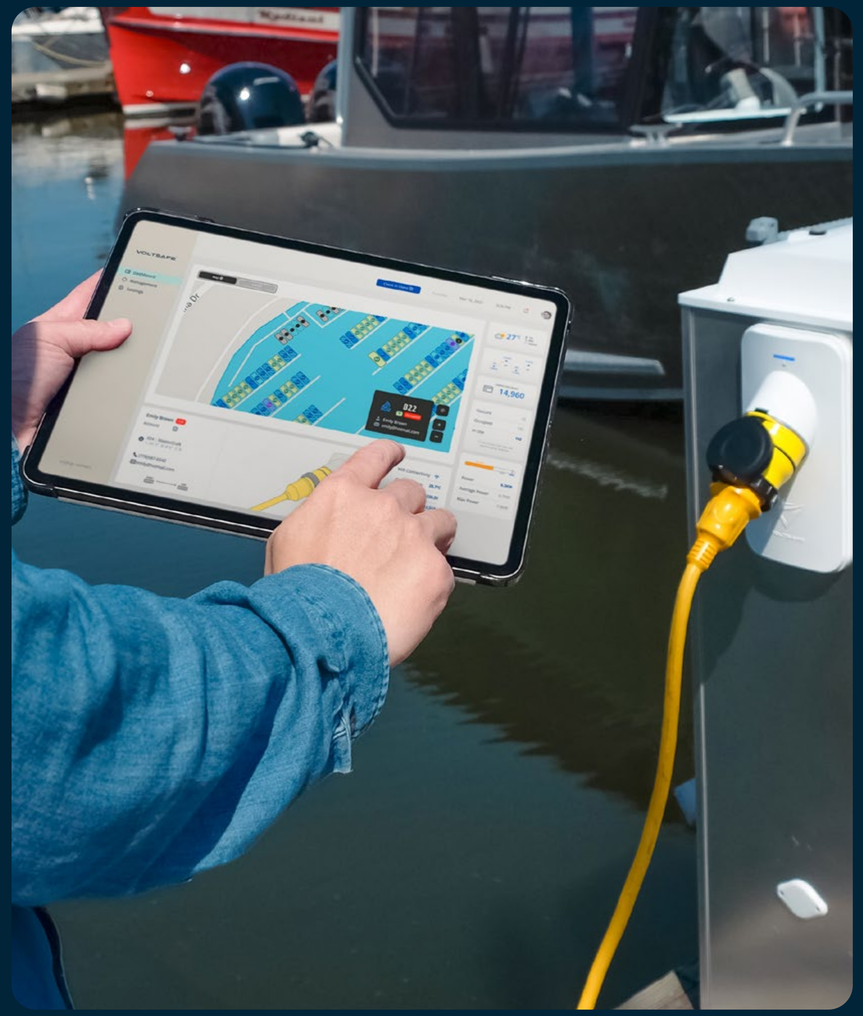
From Energy Expense
→ Energy Asset

- EV boats + dock electrification = new demand profiles
- Microgrid resiliency & revenue (load shaving, storage)
- Participating in grid programs = ROI multiplier

# 8 GRANTS, REBATES & SUBSIDIES

- Federal: IRA electrification grants
- State: WA clean infrastructure incentives
- Utilities: Peak shaving & metering rebates

**Tip:** Have your ROI roadmap ready — grant reviewers expect it



# 9 THE MARKET LANDSCAPE TODAY

- Most marinas run on 20th-century tech
- Code changes force decisions
- Boaters expect seamless, safe, smart service
- Hardware/software silos must merge

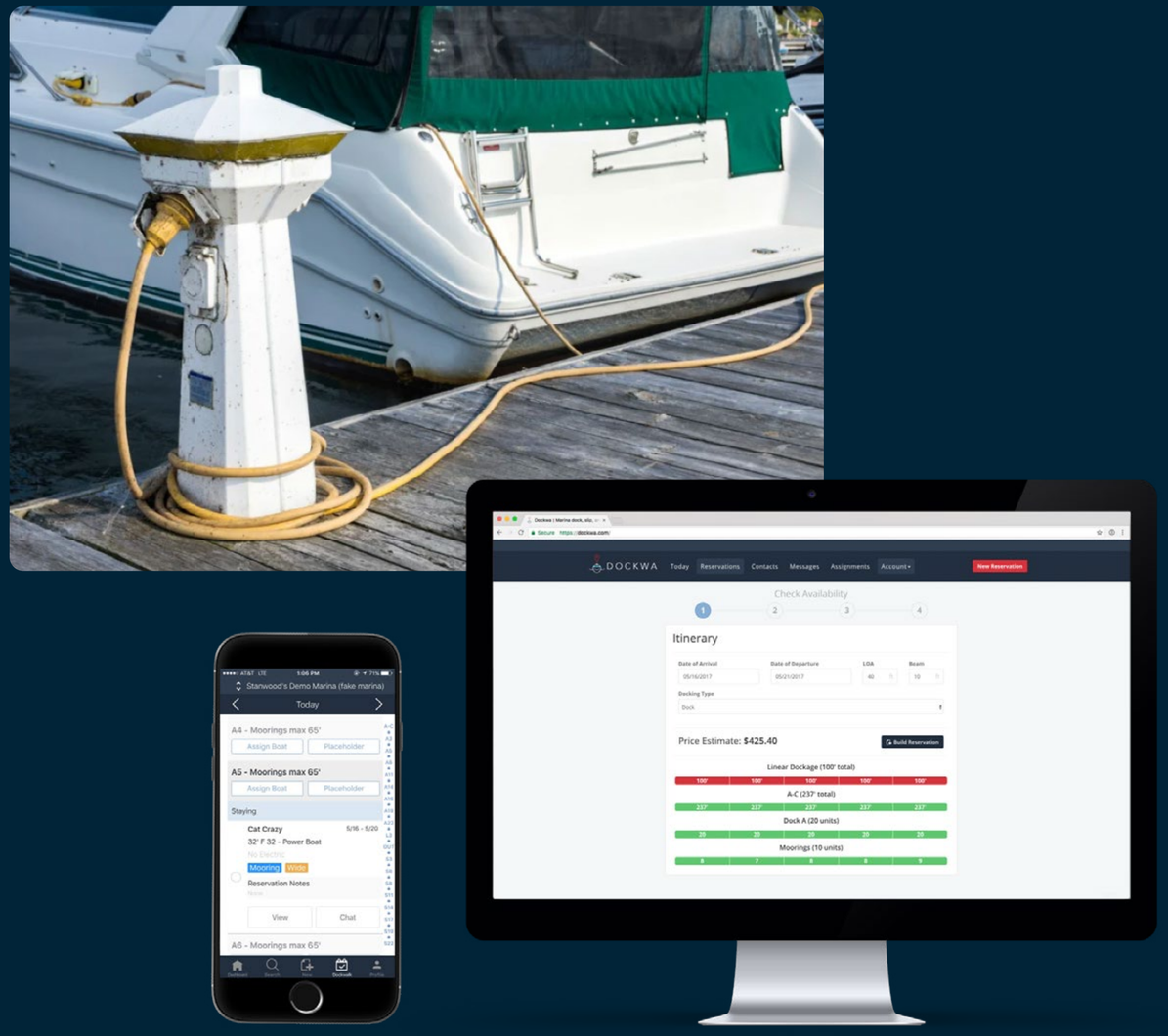
# 9 THE PLAYERS TRYING TO KEEP UP

**Eaton, HyPower**
Traditional hardware +
bolt-on metering

**MarineSync, Quadlogic**
Utility monitoring, no smart control

**Dockwa, Molo**
CRM with limited hardware touch

**VoltSafe**
Full-stack, prongless, real-time
smart power



# FINAL TAKEAWAYS

- NEC mandates are real — and they’re coming fast
- Smart shore power pays for itself (less downtime, less liability)
- Electrification can be an asset, not just a cost
- The future isn’t bolt-on smart tech. It’s native intelligence

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# 2023 IBEX Innovation Award Interview with VoltSafe

**WRITTEN BY: RYAN GULLANG**
**NEWS DATE: JANUARY 17, 2024**
2023 WINNER INTERVIEWS
NEW IN 2023

# IBEX SHOW – Innovation Award Winner Interview

January 2024

## VoltSafe Makes Shore Power Safer, Simpler, and Smarter

Electricity and water are quarrelsome bedfellows. It's one of those physical properties that modern life imparts on a subconscious level. That's why, at first glance, a shore power pedestal sitting on a dock may elicit the same twinge as a hairdryer perched on the rim of a bathtub. Enter VoltSafe Marine – a company that looked at the pain points imposed by pedestals and said "That just won't do."

The VoltSafe system takes an innovative approach to making shore power smarter, simpler, and safer for boaters. As such, IBEX's 2023 Innovation panel recognized it with an award in the Boatyard and Marina Hardware and Software category. With boats becoming ever more electrified, VoltSafe is paving the way towards safer shore power and more sustainable boating.


**What problem was VoltSafe designed to solve?**

VoltSafe makes connecting to high-voltage electricity safer, simpler, and smarter than ever before. For years, we have struggled with antiquated ways to connect to electricity using prongs and recessed contacts. Particularly around water, this is a dangerous combination. Corrosion can go undetected inside shore power outlets, leading to arcing and devastating marina and boat fires. Live cords around water are especially dangerous. VoltSafe's marine solution solves these problems and more, making power usage around water safer than ever. By making it an IoT-enabled product, we've enhanced its safety by pairing it with dashboard tools that help conserve energy, detect leakage, and gain operational efficiencies. In addition to the extensive feature-set that our VoltSafe Marine shore power pedestal, marina dashboard, and companion app provide; future iterations will even be able to offer real-time views of each slip for both the boater and the marina manager via a pedestal camera to the dashboard or companion app, further enhancing your ability to protect your investment. Overall, VoltSafe Marine ultimately saves time and money for marina managers, giving peace of mind to boaters and marina operators alike.

**Who is the target market for VoltSafe?**

Marina owners and operators are the core target for our IBEX Innovation award-winning marine solution. Our shore power pedestal and software management platform are future-proofing marinas. We're providing the safest, most dependable shore power pedestal and dashboard ever imagined. Our initial product was aimed at the boat side, however, by adapting to support the marina first, we can still support the boater via adapters and the companion app making it a win-win, and more lucrative for the business.

**Who is currently using VoltSafe? What feedback have you received?**

VoltSafe is currently live in select marinas, with more marinas being on-boarded for a wide-scale beta test prior to distribution of commercialized units coming soon.

We've been actively engaging with marinas for several months, listening to key pain points, and adapting our software solution to manage those concerns. There is plenty of excitement at the numerous marine industry trade shows we have been at all year long, primarily driven around the magnetic connection, the safety aspect, combined with its ability to minimize costs and save time and energy slip by slip. Frequent feedback includes comments such as Finally! or It's about time! or remarks around it offering game-changing innovation that will disrupt the industry. We've met with so many people and shared great conversations about how our award-winning shore power solution can put an end to countless issues and concerns over safety and efficiency for boaters and marinas. We've built more than just a shore power pedestal – we're future-proofing to deliver next-level safety, and an outstanding user experience when it comes to managing power at the docks.


SOUNDINGS

# Trade Only

TRADEONLYTODAY.COM NOVEMBER 2024 VOL. LXII NO.5

## 2024'S MOST INNOVATIVE MARINE COMPANIES

# Soundings Trade Only

November 2024

# KEY PARTNERSHIPS

**Yachting Ventures**
Community Member

**Innovate BC & NRC IRAP**
BC Fast Pilot Grant
$180K CAD

**Royal Canadian Navy**
Pilot Project for Level 2 EV Chargers

**Association of British Columbia Marine Industries**
Proud Member

**Vancouver Maritime Centre for Climate**
Proud Member

**Pacific Coast Congress of Harbormasters & Port Managers**
Proud Member

**International Electric Marine Association**
Proud Member

**Washington Maritime Blue**
Proud Member

**National Marine Manufacturers Association**
Proud Member

**Association of Marina Industries**
Proud Member

**American Boat and Yacht Council**
Proud Member

**AgeTech CollaborativeTM by AARP**
Portfolio Company

**EPiC by HKSTP**
Finalist: PropTech Category

**Next Generation Manufacturing Canada**
Supported Company

**MaRS Venture Services**
Supported Company

**Consumer Technology Association**
Innovation Awards Winner, Mark of Excellence & Proud Member

## AWARDS & RECOGNITION

**IBEX**
**Innovation Award**
Boatyard and Marina
Hardware and Software

**CES**
**Innovation Award**
Vehicle Tech and
Advanced Mobility

**Soundings Trade Only**
Most Innovative Marine
Company Award

**Innovative Solutions Canada**
Grant Recipient

**Forbes**
Listed as one of Canada's
Best Startup Employers

**Winner of Startup Pitch Competition**
Global-Scale Marine
Equipment Trade Show

**Foresight 50**
Listed as one of Canada's Most
Investible Cleantech Ventures

**Canada's Ocean Supercluster**
Member: CEPAC Project 2024

## ACCELERATOR PROGRAMS

**Graduated Creative Destruction Lab Atlantic**
Oceans Stream

**SoCal Cleantech Express**
Ports & Logistics
(Canadian Trade Commissionaer Service)

**Newlab**
Supported Company

# LET’S TALK

**TREVOR BURGESS**
CEO & Co-founder, VoltSafe
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# VOLTSAFE TECH IS SCALABLE TO ANY APPLICATION THAT TRANSFERS HIGH VOLTAGE ELECTRICITY.

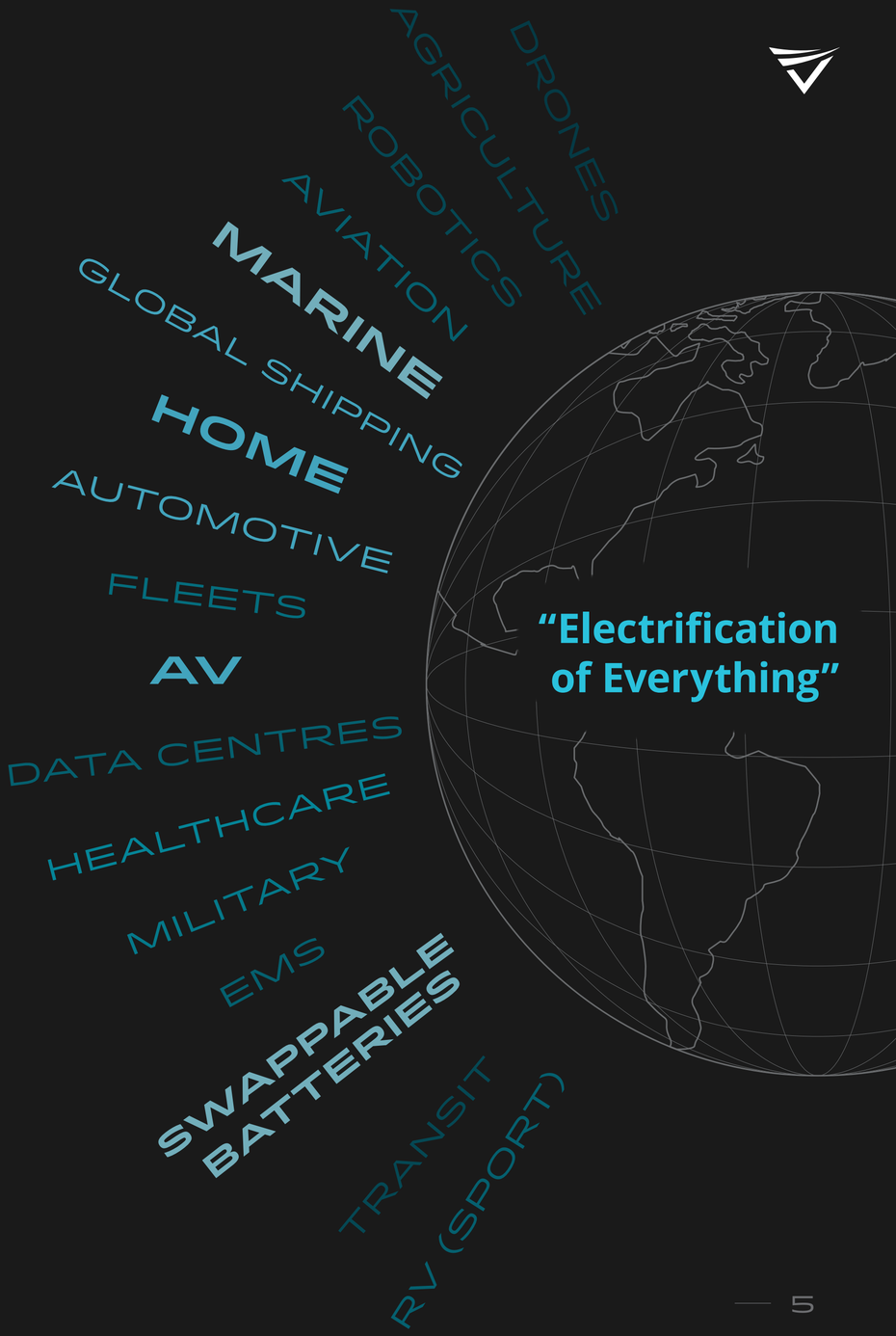
Our product pipeline includes novel hardware and software solutions that are easily adaptable for marine, household, commercial, industrial, electric and autonomous vehicles, military and emergency services, data centres, swappable batteries, and more.

MARINAS & ELECTRIC BOATS

SWAPPABLE BATTERIES

MILITARY

AUTONOMOUS CHARGING



# 555.35 Ground-Fault Protection of Equipment (GFPE) and Ground-Fault Circuit Interrupter

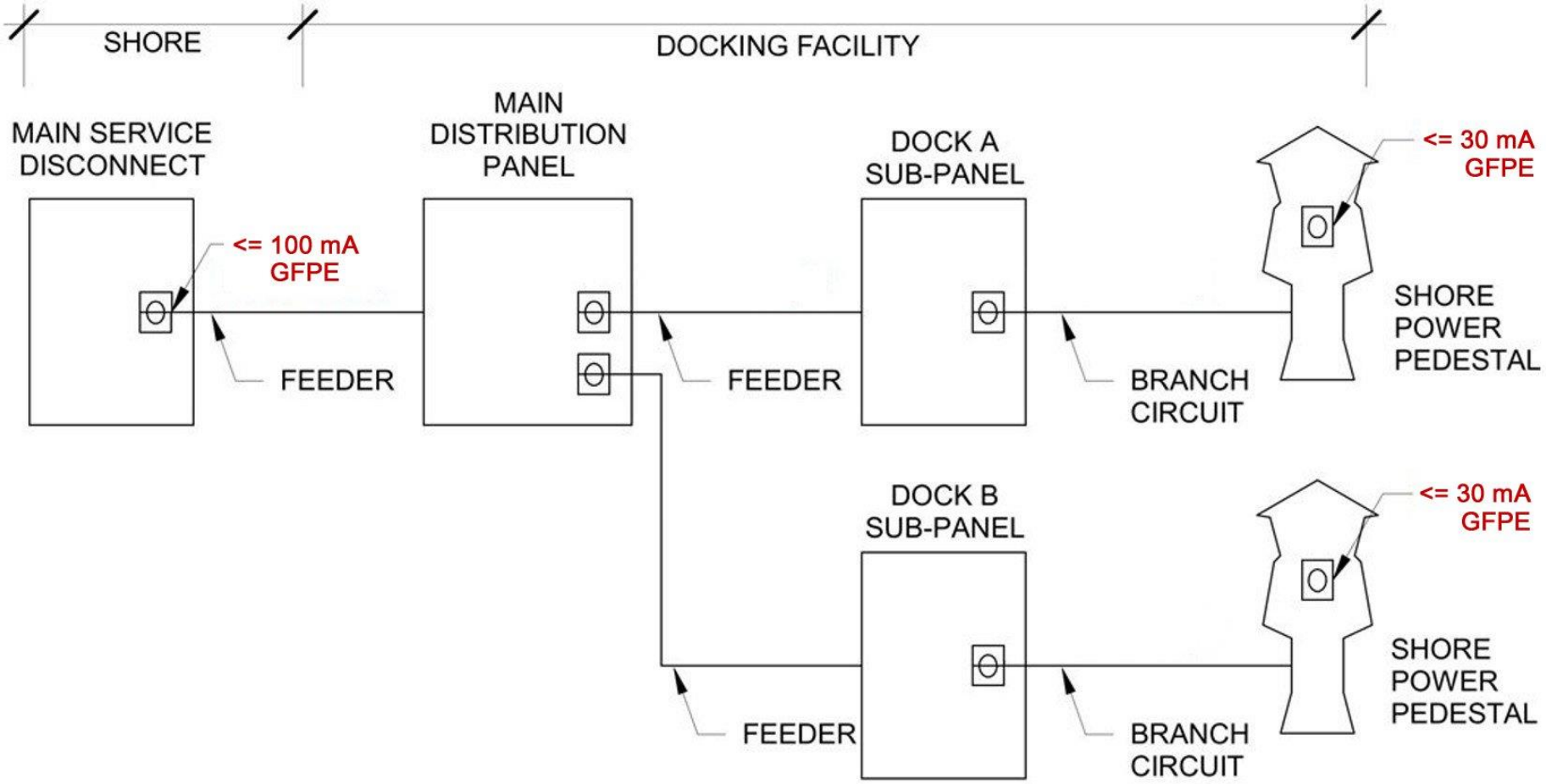



Diagram Courtesy of Gary Loftis