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Transportation Vanguard Award 2020 Nomination Form

***Who is being nominated?***

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| --- | --- | --- | --- | --- | --- | --- |
| **Last Name: Johnson** | **First Name: Cody** | | | | **Date: September 16, 2020** | |
| **Email: JohnsoCo@wsdot.wa.gov** | | | **Position Title: Digital Systems Port Engineer** | | | |
| **Department: Vessel Engineering** | | | | | **Phone: (206) 300-1230** | |
| **Street Address: 2901 3rd Ave** | | **City: Seattle** | | **State: WA** | | **Zip code: 98121** |
| **AASHTO Committee Membership (optional):** Click here to enter text. | | | | | | |

***Who is nominating this person?***

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| --- | --- | --- | --- | --- | --- | --- |
| **Last Name: Von Ruden** | **First Name: Matt** | | | | **Date: September 16, 2020** | |
| **Email: VonRudM@wsdot.wa.gov** | | | **Position Title: Director of Vessel Engineering & Maint** | | | |
| **Department: Washington State Ferries, WSDOT** | | | | | **Phone: 206-515-3863** | |
| **Street Address: 2901 3rd Ave** | | **City: Seattle** | | **State: WA** | | **Zip code: 98121** |
| **Endorsement of Member Department Secretary/Director (signature):** | | | | | | |

***Instructions:***

Using a maximum of 2 additional single-sided pages, please explain why this individual should be selected as the 2020 Transportation Vanguard Award recipient. Please include as much specific information about the candidate as possible, including special projects, personal attributes, dedication, etc.

Send nominations by **September 30, 2020,** via e-mail to  [**jdawkins@aashto.org**](mailto:%20jdawkins@aashto.org)**.** Nominations must be submitted **as a single file** in Microsoft Word format using ***TVA2020\_*** ***LastName\_FirstName.doc*** as the file name.

**CODY JOHNSON – WSDOT, Washington State Ferries, Vessel Port Engineer Digital Systems**

Washington State Ferries (WSF) is proud to nominate Cody Johnson for the AASHTO Transportation Vanguard Award recognizing his successful innovations in digital systems support for our entire 21-vessel fleet. As you read Cody’s accomplishments, please recognize his exceptional ability to thrive in diverse roles as a staff support engineer, a deck plate technician, a system design engineer, a researcher, a remote IT support administrator, and an equipment and software dispatcher. Cody is clearly a top performer, an enthusiastic team member, an ambassador for modern technologies, and an invaluable vessel asset. It gives me great pleasure to highlight a few of his many outstanding accomplishments this last year.

The Washington State Department of Transportation (WSDOT), acting through its Washington State Ferries, operates the largest ferry system in the United States. Twenty-One ferries cross Puget Sound and its inland waterways, carrying more than 24 million passengers each year to 20 different ports of call. From Tacoma, Washington, to Sidney, British Columbia, we travel up and down the Sound, acting as a marine highway for commercial users, tourists and daily commuters alike.

After transitioning to the public sector following his successful military service, Cody quickly advanced his responsibilities within our agency. He entered our ferry service as a shipyard electrician, seamlessly advanced to electrical design support within the Vessels Naval Architecture branch, and currently serves as Port Engineer for the fleet’s digital systems maintenance and support.

Over time, and with various new system digital technologies, Cody’s role in digital systems support is one of our most time sensitive and critical fields. Modern engineering system controls have advanced to include digital interfaces, expanding Cody’s responsibilities to include nearly all systems aboard all 21 state ferries. Unlike most mechanical and electrical systems, digital systems don’t precede their failures with noises, vibrations, performance fluctuations or speed/temperature changes. Digital system failures occur instantaneously; they immediately limit operations, and must be addressed immediately with advanced system familiarity. It’s not uncommon for Cody to correct systems casualties on multiple vessels per day, demonstrating extreme adaptability in correcting critical system discrepancies on board our southern and northern routes on the same day, a geographic area spanning over three hours by car and often a vessel transit.

**M/V Issaquah Steering** – When Cody first filled his current position, the M/V ISSAQUAH was removed from service with an ongoing steering system retrofit. Newly promulgated maritime regulations had prompted various changes to the ongoing installation, and the approved design was subsequently and substantially altered. This was neither predicted nor desired, and resolution was our engineering division’s highest priority. It should go without saying that an inoperable vessel in 21 vessel fleet, serving 20 terminals, can quickly cripple our service needs. Cody quickly recognized this opportunity, navigated the remaining technical challenges, and reconfigured all new design details to meet current regulatory compliance. Cody’s expertise and prioritization rapidly resolved all open system discrepancies, passed aggressive testing and trials, was approved by the United States Coast Guard (USCG), and has operated trouble free this entire year.

**Kwa-di Tabil Class Steering** - Following several vessel groundings at the challenging terminal in Coupeville, WA, the USCG opened an inquiry. Cody quickly identified several component upgrades to improve system reliability. Navigational challenges for this responsive vessel class, at this close-quarters terminal, and with our strongest terminal currents, elevated the criticality of the safety of the steering system. His recommendations were insightful and accurate, included several technology upgrades, and added electronic switches that are less prone to vibration disconnects, advanced logic controllers, and integrated a newly required data recorder. The design and technology upgrades were approved by the USCG, and the inquiry was closed.  He served as the project engineer and project manager this past year and our first installation is currently scheduled for this coming year. Additionally, he worked with the original equipment manufacturer to ensure the refit included upgraded steering levers and gear boxes, while also adding feedback switches in the vessel’s two steering compartments.

**Issaquah & Olympic Class Auto-Declutch** – Two of our three classes of diesel mechanical ferries lack automatic declutch mechanisms, a new but initially waivered maritime regulation. When two rare and unpredicted engine shutdowns occurred in early 2020, it was clearly time to bring these aged vessels to current regulatory compliance. Cody designed a digital interface with a time delayed safety lockout to automatically declutch and safely remove an unsafe propulsion engine from active service, reducing the chance of a full propulsion shut down. Safely removing an unsafe or inoperable engine from the mechanical driveline will ensure the safe navigation of the vessel, crew and all public passengers. His concept and innovative design were submitted to the USCG’s Marine Safety Center for review and approval in July 2020, and are tentatively planned for installation on board all six Issaquah Class and all four Olympic Class ferries. This is another prime example of Cody’s emphasis on process improvement and vessel safety.

**Software Library Cloud** – Cody has consolidated all vessel software programs and support to a single library storage system to streamline timeliness and accuracy of fleet technical support. The single library storage system will make for consistent and timely deployment to 21 vessels within minutes, not hours or days. The access will immediately reduce delays and cancelations of ferry crossings, a major objective for all our employees. The library is nearly complete, currently located on our public server, and final details are currently in review to upgrade access to a Cloud based application.

**Obsolescence Planning** – Cody carefully outlined all software system components, from vital switch gear, to critical propulsion controls and equipment monitoring, to non-vital hotel service systems. This project has projected respective component obsolescence, and helped our preservation engineers to prioritize and budget for the next ten years of system recapitalization projects. Maintaining supportable technology and equipment across a 60-year service life has many such challenges. For reference, an 8-track tape only gained popularity 55 years ago, and we haven’t seen those in the last 35 years. Obsolescence is often only discussed in extremis, but this preventative effort prevents numerous tie-ups.

**Electronics Center of Excellence** – Cody has helped define and support the business plan to build an Electronics Support Shop at the Eagle Harbor Maintenance Facility (EHMF), an organic resource to resolve dozens of monthly equipment casualties which are expensive to address with commercial technical services. Cody and the EHMF sole electronic technician have outlined the requisite training and support equipment to quickly address the recurring technical challenges routinely encountered with all navigation, communications and control (propulsion, steering, power management) systems. He is actively working to commission the shop this month, with hiring in process right now.

**Fleetwide Condition Monitoring** – Cody identified and applied for several grants and promoted the discussion of adding several aspects of machine learning to the machinery control systems on board our ferries. This initiative looked at innovative technologies to trend and compare several thousand operational sensors, establish the requisite firewalls, and help operators improve system operations. Following the healthy discussions, although unsuccessful in application, he advanced our fleet-wide condition monitoring. He actively draws data from all 21 vessels and analyzes it, and further, he established communication media between data and our online maintenance database, improving the accuracy of our maintenance planning and machinery history. In doing so, he has also created the architecture to employ future machine learning. Again, this is a strong example of where Cody’s specific skills, initiative and intuition have helped improve the quality and accuracy of our vessel support.