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the missing piece of CCTV

THE FOOTAGE WHISPERER

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UTILITY VALUE OF
COM-SUR™ FOR
AQUACULTURE
FACILITIES

WELCOME



AUDIT HOURS OF FOOTAGE IN MINUTES
FIND OUT HOW COM-SUR, THE BEST
'MOUSETRAP' WILL HELP

["Seeing is believing - See what the camera saw"](#)

CCTV and other forms of video surveillance are commonly used in aquaculture (cultivation of various aquatic species, including fish, shellfish, crustaceans, and aquatic plants, to produce seafood for human consumption) but footage is often only reviewed reactively. Our company realized this problem early-on and has developed the world's only CCTV/other surveillance video footage auditing software that encourages daily auditing (hours in minutes) of footage, filling the gap for a complete "workflow". The software works with existing cameras and VMS, regardless of type/brand, and provides a standardized approach for intelligent incident reporting. Our software also offers exceptional investigative capabilities.

'COM-SUR' – THE WORLD'S ONLY CCTV/OTHER SURVEILLANCE VIDEO FOOTAGE AUDITING, SMART BACKUP, AND STANDARDIZED INTELLIGENT INCIDENT REPORTING SOFTWARE – THE MISSING PIECE OF CCTV/OTHER SURVEILLANCE VIDEO

COM-SUR is the world's only CCTV/other surveillance video footage auditing, smart backup, and standardized intelligent incident reporting software that serves as a complete workflow and force multiplier. It helps audit 24 hours of footage in minutes, reduces data size, creates standardized intelligent reports, and delivers business intelligence. COM-SUR helps unlock hidden information in CCTV/surveillance video footage and enables people to gain actionable intelligence, improve homeland security, prevent crime and losses, identify and mitigate threats and hazards, and improve operational efficiency. It empowers people to gain new jobs as CCTV/surveillance video footage auditors and start new businesses of auditing video footage. Like MS Office, COM-SUR is an enabler that makes it easy to work with CCTV and other surveillance cameras in a standardized way, leading to better decision-making. It also offers exceptional investigative capabilities.

HOW COM-SUR SMARTLY REDUCES 'VIDEO' STORAGE SIZE

COM-SUR employs an innovative approach to

smartly reduce the amount of video to be audited and consequently the storage size of videos. Regardless of the video's frame rate, COM-SUR captures a single screenshot of the consolidated 'moment' of 'that' one second, when the I, P, and B frames come together. This method significantly reduces data size without sacrificing vital information. It goes without saying that when multiple cameras are displayed in a grid view, say 4x4, the storage size is further reduced since all the cameras are captured as a single image. Since no suggestion is being made to replace the actual video with screenshots, COM-SUR acts as a wonderful supportive technology both to audit (review) just 86400 frames representing 24 hours and reducing the data size at the same time.

CHALLENGES FACED BY AQUACULTURE FACILITIES

1. Unauthorized access:

Unauthorized access to aquaculture facilities poses a significant threat. Intruders may attempt to enter the facility to steal or sabotage aquatic stocks, equipment, or infrastructure.

2. Theft and vandalism:

Theft of aquatic stocks, equipment, or supplies, as well as vandalism, can lead to financial losses and operational disruptions.

3. Poaching and illegal fishing:

Aquaculture facilities in open water areas may be vulnerable to poaching and illegal fishing activities.

4. Biosecurity risks:

Disease outbreaks among aquatic stocks can have severe economic consequences for aquaculture operations.

5. Equipment failures:

Malfunctions or failures of aquaculture equipment, such as water pumps or aeration systems, can impact the health of aquatic stocks.

6. Cybersecurity threats:

With the increasing use of technology in aquaculture operations, there is a potential risk of cybersecurity threats.

7. Compliance issues:

Aquaculture facilities must comply with various regulations related to environmental protection, water quality, and operational practices.

8. Employee security:

Aquaculture facilities may be located in remote or challenging environments, and ensuring the well-being of workers involves addressing potential hazards and providing appropriate training.

9. Insider threats:

Aquaculture facilities have to deal with insider threats from disgruntled employees or even unwitting staff who fail to follow proper security and safety measures.

10. Humongous growth of surveillance video:

The exponential growth of surveillance cameras has resulted in an unprecedented surge in surveillance video. Effectively managing this data has become a daunting challenge due to the massive storage capacity required, especially considering the prolonged retention periods necessary for security, incident investigation, or legal purposes. Furthermore, the prevalence of high-resolution

video with increasing megapixels compounds the storage demands, making efficient data management an urgent priority for organizations grappling with the immense volume of surveillance footage.

COVID-19 PANDEMIC

The pandemic severely impacted aquaculture facilities worldwide. Lockdowns and travel restrictions resulted in labor challenges, affecting tasks like feeding and monitoring. Supply chain disruptions led to shortages of inputs, logistical issues, and financial strain. Fluctuations in market demand and export challenges affected sales and revenue streams, prompting aquaculture producers to adapt to changing market dynamics and explore new distribution channels. The pandemic raised biosecurity concerns, prompting facilities to implement additional measures. Guidelines were issued to prevent the spread of COVID-19, but outbreaks still occurred.

USE OF VIDEO SURVEILLANCE AT AQUACULTURE FACILITIES

Most aquaculture facilities have video surveillance covering the following areas:

- Entry and exit points
- Ponds and tanks
- Feeding systems
- Nursery and hatchery areas
- Processing and harvesting areas
- Quarantine and treatment facilities
- Critical infrastructure areas

- Control rooms
- Storage and equipment areas
- Employee and worker areas
- Cage and net systems (applicable in case of offshore aquaculture facilities)

Further, the concerned stakeholders of aquaculture facilities generally need to review and analyse recorded CCTV video footage from time to time for investigating incidents and/or accidents, staff negligence etc., in order to corroborate evidence, as well as assisting Police/other Law Enforcement Agencies.

USE OF UNDERWATER CAMERAS AT AQUACULTURE FACILITIES

Underwater cameras play a crucial role in aquaculture facilities by providing real-time monitoring and observation of aquatic stocks, ensuring their health, behavior, and overall well-being. Here's how underwater cameras are typically used in aquaculture:

1. Fish behavior monitoring:

Underwater cameras are strategically placed in aquaculture ponds, tanks, or cages to observe and monitor the behavior of fish or other aquatic species. This includes swimming patterns, feeding activities, and interactions among the stocks.

2. Health assessment:

Underwater cameras allow for close-up observation of the health of aquatic stocks. Operators can detect signs of diseases, abnormalities, or stress-related behaviors, enabling early intervention and disease

management.

3. Feeding management:

Integrated with feeding systems, underwater cameras monitor the distribution of feed to the fish. Operators can assess feeding behavior, ensure proper feeding practices, and identify any malfunctions in the automated feeding equipment.

4. Environmental conditions:

Underwater cameras are used to monitor and assess environmental conditions within aquaculture facilities. This includes water quality parameters such as clarity, temperature, and dissolved oxygen levels, which are crucial for the health of aquatic stocks.

5. Growth and size monitoring:

Continuous monitoring of fish growth and size is facilitated by underwater cameras. This information is valuable for assessing the effectiveness of feeding practices, determining market readiness, and optimizing harvest times.

6. Breeding and reproductive behavior:

Underwater cameras in hatchery or breeding areas allow for the observation of reproductive behaviors, egg laying, and hatching processes. This is essential for managing breeding programs and ensuring successful reproduction.

7. Biosecurity monitoring:

Underwater cameras contribute to biosecurity

efforts by enabling the observation of fish health without physical contact. This minimizes the risk of introducing diseases or stress factors to aquatic stocks.

8. Quality control:

Underwater cameras assist in quality control measures by providing visual confirmation of the condition and quality of fish stocks. This is particularly important in processing and harvesting areas.

9. Security and prevention of predation:

Underwater cameras help in monitoring and preventing predation events. It allows operators to detect potential threats from predators and take preventive measures to safeguard the aquatic stocks.

10. Environmental impact assessment:

Underwater cameras are used to assess the environmental impact of aquaculture operations. Monitoring activities such as waste dispersion and sedimentation can help ensure sustainable and responsible practices.

11. Research and data collection:

Underwater cameras contribute to research efforts by providing visual data for studying fish behavior, responses to environmental conditions, and the impact of various factors on aquaculture productivity.

USE OF DRONES AT AQUACULTURE FACILITIES

Drones, or Unmanned Aerial Vehicles (UAVs), are increasingly being utilized in aquaculture facilities to enhance various aspects of

operations, monitoring, and management. Here are some ways in which drones are commonly used in aquaculture:

1. Aerial surveillance:

Drones equipped with cameras provide aerial surveillance of aquaculture facilities, offering a bird's-eye view of ponds, tanks, and infrastructure. This aids in monitoring the overall layout and identifying potential issues or irregularities.

2. Environmental monitoring:

Drones equipped with sensors can monitor environmental conditions such as water quality, temperature, and turbidity. This allows for efficient and comprehensive data collection across large areas.

3. Stock assessment:

Drones are used to conduct stock assessments by capturing aerial imagery of aquaculture ponds or cages. This information helps estimate the size, density, and health of aquatic stocks, facilitating better management decisions.

4. Feeding management:

Drones assist in feeding management by monitoring the distribution of feed across aquaculture ponds. Aerial views help assess feeding patterns, identify areas with excess or insufficient feed, and optimize feeding practices.

5. Infrastructure inspection:

Drones are deployed for infrastructure

inspections, including the assessment of dams, nets, and other facilities. Aerial inspections provide a quick and efficient way to identify structural issues and plan maintenance activities.

6. Pond or cage health monitoring:

Aerial imagery captured by drones helps monitor the health of ponds or cages. This includes identifying areas with water stagnation, algal blooms, or other issues that may impact the well-being of aquatic stocks.

7. Emergency response:

In the event of emergencies, such as disease outbreaks or environmental incidents, drones can be quickly deployed to assess the situation. Aerial surveys aid in rapid response planning and decision-making.

8. Biosecurity surveillance:

Drones contribute to biosecurity efforts by monitoring and preventing unauthorized access to aquaculture facilities. They can quickly detect potential threats, such as wildlife or human intrusion.

9. Water sampling:

Drones equipped with specialized devices can collect water samples from specific locations within aquaculture ponds. This is particularly useful for water quality testing and analysis.

10. Mapping and GIS applications:

Drones assist in mapping the layout of aquaculture facilities and creating detailed Geographic Information System (GIS) maps.

This information is valuable for planning, resource allocation, and facility design.

11. Research and data collection:

Drones support research efforts by capturing aerial data for studies on water dynamics, habitat mapping, and environmental impact assessments related to aquaculture activities.

12. Education and outreach:

Drones can be used for educational purposes and outreach by capturing aerial footage of aquaculture operations. This engaging content can be shared with the public, students, or stakeholders to raise awareness about aquaculture practices.

LIVE MONITORING – CHALLENGES

In some cases, there is a dedicated control room with operators, set up for live monitoring of cameras. However, live monitoring comes with its own set of challenges of video blindness, poor attention span, boredom, operator bias, false alerts, and so on.

Moreover, these cameras continuously capture and record humungous amounts of video data. It therefore becomes a daunting task for the operators to review and analyse this data whenever the need arises. Thus, it may be noted that benefits from video surveillance systems can accrue only when they are used optimally, suggestions for which are enumerated further on, in this document.

AUTOMATED SOFTWARE – WHY THEY WILL NOT WORK IN ISOLATION

In the wake of the Christchurch shooting

incident, several high-profile places of worship considered deploying gun detection technology. However, there are concerns about its efficacy, since it may not be able to detect all types of weapons, or the perpetrator could still create damage before being detected. Similarly, automated systems like video analytics, AI/ML can only detect what they have been programmed for. What about the rest? Again, these technologies are prone to triggering huge amounts of false alarms. Also, since the permutation combinations of exceptions can be vast and varied, it becomes almost impossible to automate every kind of exception. Facial recognition technology also raises ethical and privacy concerns, and has been found to produce inaccurate results, especially for certain ethnic groups. Therefore, experts suggest that while automated technologies will continue to grow, human intervention and intelligence will still be necessary to verify alerts and ensure their efficacy.

“CCTV AND OTHER FORMS OF VIDEO SURVEILLANCE ARE NOT ENOUGH – WE MAKE IT WORK FOR YOU”

While it is not being suggested that optimal usage of video surveillance can cure all issues, several issues of the following kind can be addressed by doing just a little 'more' with respect to making the optimal use of video surveillance systems:

- Behavior of aquatic animals
- Health of aquatic animals
- Biosecurity risks
- Intrusions, especially by animals

- Vandalism
- Tampering of equipment
- Compliance issues
- Worker health and safety issues
- Issues due to climate change
- Staff negligence
- Insider job/security lapses
- Accidents/Causes of potential accidents
- Unauthorized/unlawful activities/visitors
- Inattentive staff (e.g. guard sleeping)
- Fraud/loss/corruption/theft
- Recces/suspicious movements/activities
- Potentially hazardous material
- Issues with female staff
- Cameras/recorder malfunctions

So, what is the 'more' that needs to be done?

1) AUDIT SURVEILLANCE VIDEO FOOTAGE DAILY AS A STANDARD OPERATING PROCEDURE

'Auditing' means 'seeing' what the cameras 'saw'. Auditing of surveillance video footage should be done daily (continuous investigation) to identify potential issues and threats.

Auditing is a dedicated and systematic process that helps address challenges related to live

monitoring and alert-based systems. Auditing helps in evaluating analyzing incidents to improve existing policies, procedures, and processes. Concerned personnel should be trained to become video footage auditors, and the audit teams should be rotated to avoid complacency/collusion. Daily auditing of surveillance video footage can also help in adhering to the principles of Kaizen and TQM for business improvement.

2) DOCUMENT AUDIT FINDINGS/INCIDENTS

Audit findings/incidents should be documented in a standardized template to find the root cause to prevent future recurrences. Historical data of such findings/incidents can reveal patterns that can help take better informed corrective and preventive action. If stakeholders of all aquaculture facilities report incidents in a standardized template, relevant authorities can derive business intelligence from the data and take action for the collective benefit of all aquaculture facilities worldwide.

3) ENSURE DISASTER RECOVERY OF SURVEILLANCE VIDEO FOOTAGE – LIKE A 'BLACKBOX'

Surveillance video footage must be stored at multiple locations in order to ensure that even if the recorder/storage device is stolen, destroyed or tampered with the data is never lost. Further, any backed-up data must easily be searchable and retrievable; else, it is going to be a nightmare finding the relevant video.

4) DISPLAY DYNAMIC INFORMATION AT RELEVANT PLACES

Document and display details of information that is dynamic in nature in relevant areas.

For example:

1. List of authorized staff.
2. List of authorized security personnel deployed at the aquaculture facility.
3. List of habitual offenders/suspects likely to visit the aquaculture facility (a 'Watch out' list).

5) USE A POWERFUL NEW SIGNAGE

"WE AUDIT CCTV VIDEO FOOTAGE EVERYDAY".

One size, one color, one powerful message.
Across the nation.

CONCLUSION

"You see, but you do not observe" is a quote by Sherlock Holmes in A Scandal in Bohemia (1891, written by Sir Arthur Conan Doyle). COM-SUR makes 'observation' far effortless and effectual leading to superior results.

"Cameras don't lie" - but how will you know unless you 'see' what the cameras 'saw'?
Audit video - why suffer!

Get award-winning COM-SUR now. Don't wait for things to go wrong!

Finally, allow us to present three important mantras that change the landscape of video surveillance:

1. Auditing is fundamental – everything else is peripheral.
2. Cameras have lenses – humans have eyes.
3. Let's make cameras 'accountable'.