

Upper Skagit Dams Are Huge Asset To County

By the Editor

Be it said to the everlasting credit and honor of "J. D." Ross and his zealous associates, a few of whom are still living and carrying on, and to the credit of the good people of Seattle who followed their leadership, they have created a marvelous, living, pulsating, engineering project on the upper Skagit river that will endure and serve the people of their city and adjoining coast communities for countless generations to come. They have reclaimed a mountain wilderness for human service, they have transformed a raging, rushing river, confined for thirty long miles in an almost inaccessible, towering, precipitous canyon, into a modern gigantic hydroelectric power system. They have harnessed nature, without destroying it, to serve the needs of man. They have taken possession of the flood waters of this short but mighty Pacific Coast river, removing the menace of annual disaster to the rich and broad valley lands below, and stored them to furnish more power. The engineers of the Seattle City Light project on the upper Skagit have done their job with consummate skill and vision, passing the utilization of this vast power into other hands for adequate distribution and use.

After an interval of several years we enjoyed the privilege last week of visiting and thoroughly inspecting this great power project located practically in our own backyard, so close that we do not appreciate its size and importance. It really belongs to Skagit county by every rule of geography and contiguity, although the first and original Gorge powerhouse at Newhalem lies three miles north of our county boundary line and is, therefore, in Whatcom county. The entire project is inaccessible to western Whatcom; it must be entered through Skagit county and through this county flows all the traffic connected with it. Every mile of inhabited and cultivated Skagit valley, aside from the project installations, lies in Skagit county. Some day we hope the legislature will consider these facts seriously enough to attach this eastern area of Whatcom county to Skagit county, of which it should be a part for all practicable purposes.

Well Guarded

For years, or since construction began up there, the City of Seattle has featured summer excursions carrying thousands of sightseers, but war has changed all this. Now it is almost as hard to get a pass into this closely guarded area as it would be to get through the eye of a needle. Official business or family relationships are about the only keys that will unlock the gates at Newhalem. As it is all within the National Forest, the government is in supreme control, and it is no mistake to state that it exercises this authority to the limit. In addition to necessary protection to the power project similar protection must be accorded to the forests which cover the region. However, Supt't Hoffman in Seattle kindly issued the required permission, based on the close mutual interest we have in being as well acquainted as possible with the project, and resident engineers and officials accorded us every hospitality and convenience and aid during our three days' stay. An intense loyalty to the work by all connected with it prevails everywhere, a deep and commendable pride that after all has made its success possible.

Courageous Job

Building the Skagit project was not child's play but a man's job. It took grit, courage, sweat and hardship to drive tunnels, build dams, install machinery, to even set up living quarters up there. The cost cannot be measured in money. Where the upper dam, Ross Dam, was built in the past few years and where it is now being raised, there wasn't a level spot on which to build crude living quarters. There still isn't. It is just a precipitous, rocky canyon. Buildings are perched on rocks, blasted to furnish sites. The only wharf at the head of Diablo Lake is a floating one. Contractors are digging out the side of a hill for more operating room. It is probably the world's worst construction site. An idea of the depth of the river canyon—a narrow one at that—is gained from the fact that this man-made reservoir, or lake, is 100 feet deep in the channel between Diablo and Ross Dams, a distance of about eight miles. Above Ross Dam, Ruby Lake spreads out with less depth and when new work on this dam is finally completed, this reservoir will back up five miles into Canada. Seattle has already acquired the necessary Canadian property and flood rights.

Three Units

The Seattle project consists of three separate units, built in series. Briefly the original Gorge power-

house at Newhalem, opened in 1924, receives its water through an 11,000-foot tunnel heading in the river about three miles upstream. Seven miles above Newhalem, reached by the electric gorge railway, is Diablo Dam and powerhouse. This water comes from Diablo Lake and consists of the entire flow of the river, aside from waste water. Diablo Lake extends to the foot of Ross Dam at Ruby City. As yet no power house has been erected at Ross Dam, therefore Ruby Lake, above it, is merely a storage reservoir, constructed to level off and control the flow of the upper river. Thus it will be seen, the completed project will finally possess three power plants, which will utilize the entire flow and storage of the river above Newhalem. Construction of the highest, or Ross power plant, waits on the completion of this dam.

Power Plants

At the present time the Gorge power plant, with three generators, is producing about 57,000 kilowatts at 165 voltage. Diablo plant, with only two but much more powerful generators, is producing about 120,000 kilowatts at 220 voltage. Diablo was placed in operation in 1936 and is one of the most modern plants in the United States. Both power houses are not only sightly but enormous concrete structures embodying the highest degree of architectural skill and convenience and contain every imaginable regulating, recording and operating device essential to safe and efficient operation. An intensely interesting story could be written about each one. The planning, construction and placing into operation of each one presents an engineering drama that has often been told. Each has been the mecca of thousands of visitors from all over this and foreign countries. Each has a magnificent setting, public parks, established villages of maintenance workers.

Hunters' Paradise

But it is at Ross Dam that sheer engineering drama rises to its heights in a land of endless forests, snow peaks, placid lake reservoirs miles in length, still the habitat of prowling and surprised bears and deer that will not give up their homes and myriads of game fish that have yet eluded the angler's lines. Towering above the construction camp 175 feet, or 305 feet from solid bedrock, Ross Dam presents a veritable facsimile of Niagara Falls, a roaring, fascinating cataract, whose clouds and sheets of spray at times envelop and drench everything within hundreds of feet. The comparison is further visualized when power tugs carrying workmen and material head into the waters at the base of the falls, as tourist boats do at Niagara. Raincoats and rubber boots and helmets afford the only adequate protection against complete and instant drenching.

Under a recent contract awarded the General Construction Company of Seattle, into which have been merged two other large Pacific Coast companies, J. F. Shea & Co. of Los Angeles, and the Morrison-Knutzen Co. of Boise, Ross Dam will be raised another 160 feet, or from 1365 feet sea level to 1525 feet, sea level. The present dam has a 15-foot temporary timber crib, built to increase reservoir capacity of Ruby Lake. The contract calls for completion of the new work within a year and a half, dependent on weather conditions, availability of material and labor. The contractors are now working only 150 men when they should and could be using twice that number, if men could be secured.

Would Raise Dam

Engineers estimate that the pre-

sent Ross structure can be safely pushed up 235 feet higher, or 75 feet higher than the contractors are now building it. Efforts are being made to do this but the decision is in the hands of the Federal Power Commission. Meanwhile exhaustive tests continue. Should this expansion be permitted and built, Ross Dam would rise 395 feet above the lower lake level, or 525 feet above bedrock, a gigantic mass of concrete that would have to be seen to be appreciated. Until the height of this dam is finally stabilized and until materials, machinery and labor are more readily available, construction of the power plant at Ross Dam is being postponed. For comparative purposes it may be stated that the Diablo plant operates on a 313-foot head of water. It is also important and reassuring to know that Ross Dam is 200 feet thick at its base, tapering to 63 feet at the top, crown measurements.

Huge Reservoir

Of special and vital interest to Skagit county and its people are the figures on reservoir storage, for this constitutes flood water protection. Diablo Lake now contains 90,000 acre-feet of water. Ruby Lake is about 10,000 acre-feet larger. When the present contractors raise Ross Dam 160 feet, the water storage in Ruby Lake will increase to 676,000 acre-feet. If and when the dam is raised another 75 feet, as desired but not authorized, Ruby Lake will reach the enormous size of 1,400,000 acre-feet and, as related, will cross the Canadian border, a body of water 21 miles in length. Thus, practically the complete flow of the Skagit river will be controlled and harnessed, i. e., the river above Newhalem. Below Newhalem, the Cascade, Sauk and Baker rivers as well as numbers of smaller streams flow into the Skagit to produce the heavy volume of water that finally reaches the sea at the Skagit delta. The dams on the upper Skagit built by the City of Seattle have unquestionably alleviated flood conditions in the lower valley and the greater storage planned for Ruby Lake will remove the menace, as long as the dams hold.

Comfortable Camp

While working conditions at Ross Dam are rough and primitive to an unusual degree, we can testify from experience that very comfortable and convenient housing and an abundance of good food are provided for all. Visitors take the same accommodations and fare as the workers. No special service is accorded anyone; no one wants anything special. The same thing is true of course at the older stations, Newhalem and Diablo, where there are fewer people and good homes for permanent crews. Ross Dam contractors have built three large steel barges, averaging 100 feet in length, and one larger railroad car barge, to haul material and supplies on Diablo Lake. They are now using, also, two fair sized tugs, transported there in sections and put together. Current wage scales are paid at the dam and jobs are wide open. If weather permits, work will continue all winter.

Pioneer Builders

City Light maintains only a small staff at Ruby Dam under Resident Engineer H. F. Faulkner and his assistant, C. E. Shevling. The former is a veteran on the Skagit, one of the Old Guard, and proud of it, yet withal modest concerning what

must have been his own important part. He tramped over the country with the first engineering crews, he helped pour the first concrete at Newhalem, Diablo and Ruby City. He knows the whole country, foot by foot almost, and through his long career in building dams and penstocks and tunnels has become one of the West's engineer authorities on cement and concrete work, whose judgment is acceptable to the highest government officials. Shevling, a much younger man in years but old in the acid test of Skagit experience, relieves his chief of most of the routine work and is making a record for himself on this monumental project. Mr. Currier, resident engineer at Newhalem, is also a veteran up there, now devoting himself to operations only. There are others, fine capable men, intensely interested in their work, intensely loyal, to whom we owe appreciation for many courtesies, privileges and special information.

Skagit County's Interest

Behind them all, of course, stands E. R. Hoffman, general superintendent of Seattle City Light, natural heir and successor to the beloved "J. D.," whose tomb is appropriately a huge rock in a beautiful park at Newhalem. Mr. Hoffman is also one of the pioneer builders of Seattle City Light, now watching his dreams come true. Mr. Hoffman, who is no stranger to Skagit county, wants our people to know more about the Skagit project and to take a deeper interest in it. He wants us to feel that we are a part of it all, as indeed we are. He would like us to feel that these dams and reservoirs have given us greater security against lower valley floods. We are deeply interested in the maximum development of the Skagit river and valley and in the conversion of its wild, raging, canyon waters and huge mountain drainage basins into useful and cheap electric power and auxiliary storage reservoirs. Some day we hope we may utilize some of this power created by our own river. It is our project as well as Seattle's.